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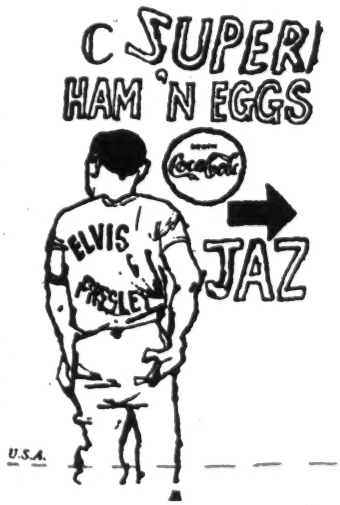
THE ARCHITECTURAL REVIEW VOLUME CXXV NUMBER 745 FEBRUARY 1959 FIVE SHILLINGS



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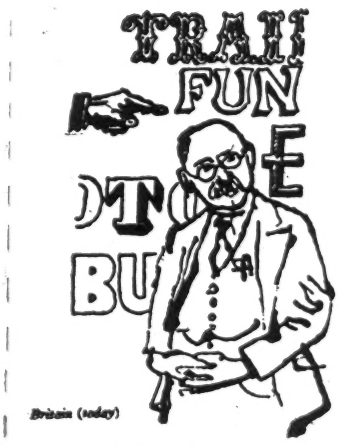
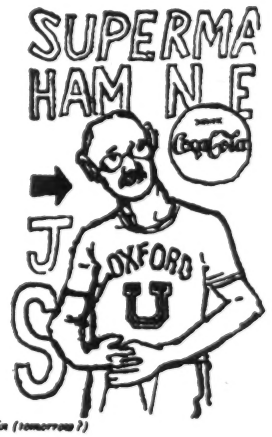


Britain (today)



Britain (tomorrow?)

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Venice

Paris

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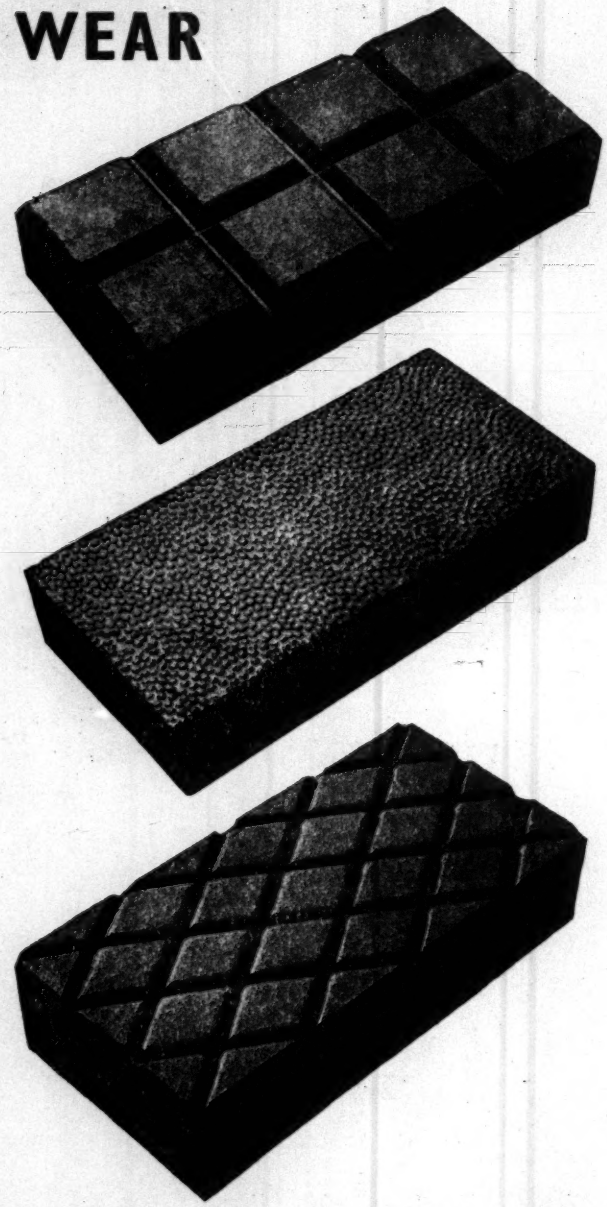

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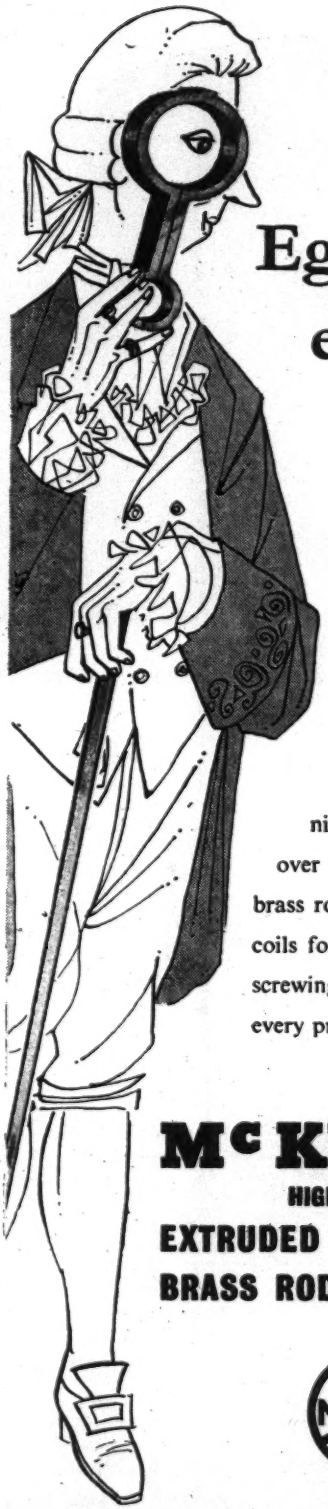

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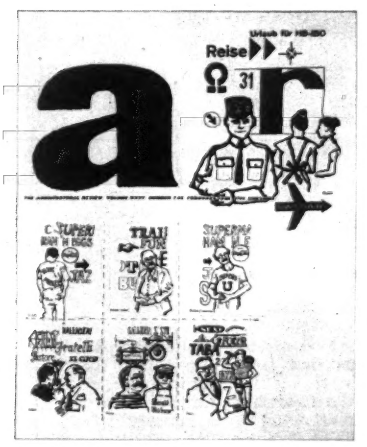
THE ARCHITECTURAL REVIEW

Volume 125 Number 745 February 1959



The Cover. This month's cover reproduces from the *SIA Journal*, an attempt by Len Deighton to characterise some well-known localities by the typography that forms the typical background to their typical inhabitants: top right, Zurich; centre left, USA; middle, England today; right, England tomorrow (?); bottom left, Milan; middle, Venice; right, Paris. The part played by lettering in establishing not only the *genius loci*, but the character of architecture generally, is a theme to which the REVIEW has constantly referred, both in general terms, and Nicolete Gray's detailed studies of letter faces. The concluding articles of her series are due to appear in the next few months, after which the whole set will be collected in a book to be published by the Architectural Press later in the year.

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SUBSCRIPTION RATE: The annual post free subscription rate, payable in advance, is £3 3s. 0d. sterling, in U.S.A. and Canada $10.50, in Italy Lire 6940, elsewhere abroad £3 10s. 0d. Italian subscription agents: A. Salto, Via Santo Spirito 14, Milano; Librerie Dedalo, Via Barberini 75-77, Roma. An index is issued half-yearly and is published as a supplement to the REVIEW.

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9-13 Queen Anne's Gate, Westminster, SW1
Whitehall 0611 Five shillings

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CORRESPONDENCE

Boston Manor

To the Editors.

SIRS,—May I make some personal comments on the Boston Manor Scheme described on pages 73–4 of the January AR? While I think the idea is first rate I feel that the plan is just a formal diagram, a completely symmetrical gridiron without a curve or irregular space, and without any attempt to let the place live through its impact on the eye. Townscape, if it exists at all, means here only a bit of fiddling with the floor. Even as a basic diagram it would be far too doctrinaire and rigid: as a detailed working out it seems intolerable, giving exactly the same lack of identity and monotony as the existing Boston Manor, simply providing more of it on a given area. The same formal sterility can be seen in the newer northern parts of Roehampton; it is beginning to appear in the East End—and I feel it is more dangerous to the establishment of modern architecture as a proper living part of the environment than anything else, fake half-timbering included. This is no party line plea for the Picturesque or for any other style: it is simply an expression of the fact that the eye sees serially and continuously, not in a series of staccato jerks.

The plan (I mean literally the *plan*, not of course the idea as a whole) is inhuman in two senses, as well as being visually sterile: the two often go together. First, it will simply engender the pigeon-hole Dolphin Square feeling: the formality and the symmetry defeat any simple human gesture of identification. Yet if instead of five or six house types there had been fifty or sixty (and the range of people, thank goodness, is infinite) the variety and humanity could have been achieved naturally—not artfully contrived in the way that the garden cities were, but growing naturally out of the functional requirements—houses with the big windows, houses with no windows, houses for a family of three and houses for a family of eight and two St. Bernards. And if such a chaotic assortment gums up the rigid pattern, so much the better: a real place might be born out of it.

The second inhumanity is a simpler business. There happen to be people already living in Boston Manor, and by and large they seem to enjoy it. The intention of the plan is, I am sure, that they will enjoy the new Boston Manor more—and on the same suburban terms as at present. But they will not do this by wholesale clearance and compulsory purchase, which is all that is held out for them. Such a scheme need not (and ought not to) involve such things: at Boston Manor as at dozens of other places, there is empty land available to start with—the area over the railway tracks, the usual quota of derelict plots, and a big patch of allotments and playing fields to the south of the railway (to

take temporarily a man's extra garden and football pitch seems an acceptable injustice; to take permanently a man's house does not). The central mall could be built, axially and formally, and would give quite enough plane geometry for one suburb; the high density terraces and patio houses could be built, asymmetrically, on the available vacant land and the present inhabitants could then be invited to move in to what ought in all fairness to be a freehold house. If they did, then the existing houses could be demolished piecemeal, one at a time, and new buildings inserted. If they didn't wish to move then they should be left, and good luck to them; the old housing would then be mixed in with the new—and even a 1928 brand semi-detached would help the character along. It is one thing to propound and argue a town planning aesthetic and quite another to try and force it on to an unwilling population.

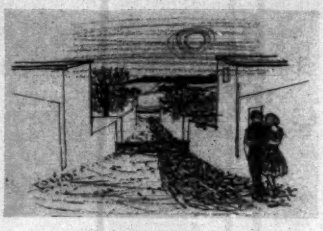
I particularly regret having to write like this about the plan because I think that Chamberlin, Powell and Bon are one of the half dozen best firms in the business and I freely grant that they have made a great success of just such a rectilinear scheme at Golden Lane (though on a small scale, and this is crucial—you can always see out to the great unplanned world—and also making the utmost play with changes of level in lieu of curves). Corb's architecture made the modern movement; Corb's town planning could very well break it unless architects remember very smartly that town-making is people; people in all their multiformity and idiosyncrasy. Being in a strait jacket is no better than being dead, however high the brow above it.

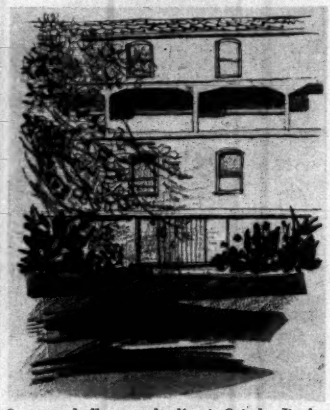
Yours, etc.,
IAN NAIRN.

Regarding Nairn's Letter

To the Editors.

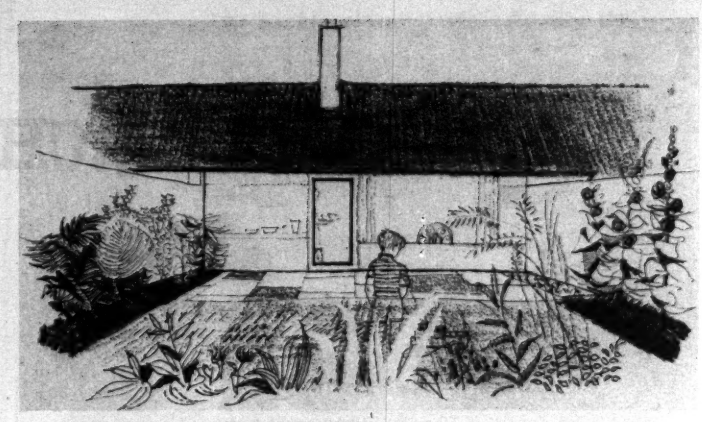
SIRS,—We find it difficult to put our finger on just what Ian Nairn is getting at. He talks about curves and irregular spaces as if they were automatically superior in some way to straight lines and rectangular spaces. He refers to our planning on different levels, the separation of roads from footways and the layout and planning of open space on a scale larger than backgardens—which are all that exist now—as being merely 'fiddling with the floor.' He says that our proposals give exactly the same lack of identity and monotony as the existing Boston Manor. By lack of identity we presume he means lack of new character; if Boston Manor were to be rebuilt in the way we have suggested (which Ian Nairn is quite entitled to deplore) it would be quite different from any other place in the whole world and would therefore at least possess the identity which springs from uniqueness. At the moment Boston Manor is a sea of two-storeyed houses flanking suburban streets which is, of course, extremely monotonous. We have proposed the creation of an entirely new centre with shops, offices, restaurants, places of entertainment, houses of infinitely greater





2, *a paved alley-way leading to Osterley Park.*
3, *front of maisonette block.*

variety than exist now, as well as flats and maisonettes for those who prefer them. Both in terms of providing more varied opportunities for living and more visual variety, this must be far from the present monotony existing at Boston Manor, which is, of course, unbearably—and unidentifiably—similar to countless other suburbs. Does Ian Nairn claim all formality as, in itself, inferior to any informality? If so, then of course our views are different as we think there is need for a coherent framework in planning and architecture; such an arrangement need not of course be a strait jacket. It appears to us that Ian Nairn thinks solely with his emotions; for instance, what do the following phrases mean: 'the formality and the symmetry defeats any simple human gesture of identification,' 'being in a strait jacket is no better than being dead however high the brow above it,' '. . . town-making is people'?



4, *a typical terraced cottage from the garden.*

5, *patio houses, with two storey bedroom blocks linked by screen walls, with the living rooms beyond.*

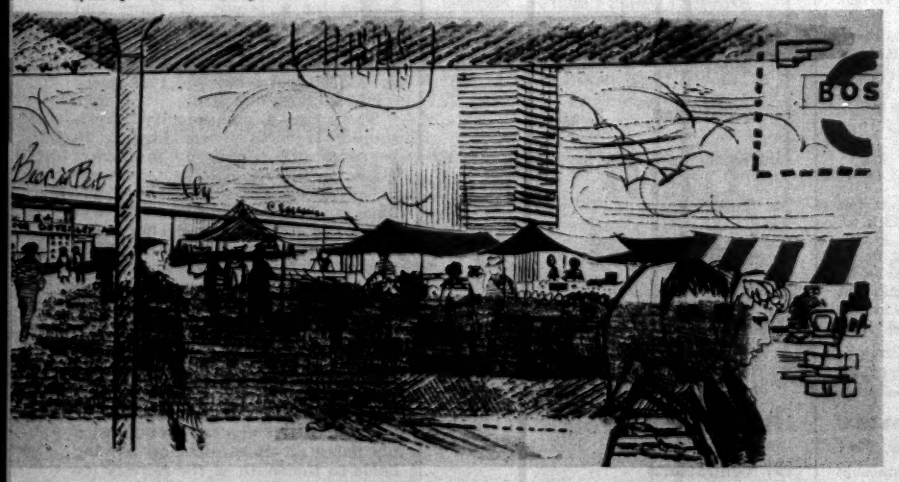
Nairn says that he favours a chaotic assortment of housing and yet denies—for some reason—that he is pleading for the picturesque. Surely one of the basic activities of architects is to try to bring order out of chaos. If you prefer chaos to order, then don't pretend that you like or want architecture. What he is really after appears to be spec builders offering infinite quaintness, people endlessly expressing their personal appetites in an aggressive way, and the accidental at all costs rather than the deliberate. If Nairn's thoughts are to be taken literally, it would appear that no wholesale redevelopment can ever take place which involves the replacement of somebody's house with a better building, however much the community at large may benefit. Consequently he allows no place for the synoptic vision, or regional planning, or for radical thinking about our ways of living in the twentieth century. This seems to us to be an extraordinarily defeatist attitude to be adopted by the highly intelligent and cultured people who occupy this overcrowded island — particularly when one remembers the technology available to us which could be used to improve our environment out of all recognition. After all, we have made mistakes in our suburbs, we can at least try to improve them even if the risk is that we make further mistakes. But can we really afford to inhibit our opportunities by regarding every Englishman's home as a holy cow?

In the last resort, of course, it is the architecture which matters; a good plan, be it symmetrical or unsymmetrical, can be ruined or realized by the quality of the buildings and spaces of which it is composed. Our design of Boston Manor is a simply expressed coherent idea intended to take advantage of the possibilities offered by the site and the opportunities implicit in the programme to create a three dimensional architectural composition, which will not only fulfil the functional requirements but will also bring delight to those who live and work there. Its development would provide endless opportunity for enrichment in form and detail. But what really has Nairn got in mind, will he point to the sort of development which he would like to see by quoting twentieth-century examples which he thinks would be appropriate at Boston Manor? In the meantime we would like you to publish a few of the original sketches which accompanied our proposals so that your readers may judge how 'inhuman and visually sterile' we are!

By the way, Nairn writes as if we were solely responsible for the Boston Manor study. While we are quite ready to weather any criticism we would like to remind you that credit for any virtues the scheme may have must be shared with Shankland and Gregory Jones.

Yours, etc.
PETER CHAMBERLIN.

1, *the square on market day.*



MARGINALIA

Le Corbusier Exhibition

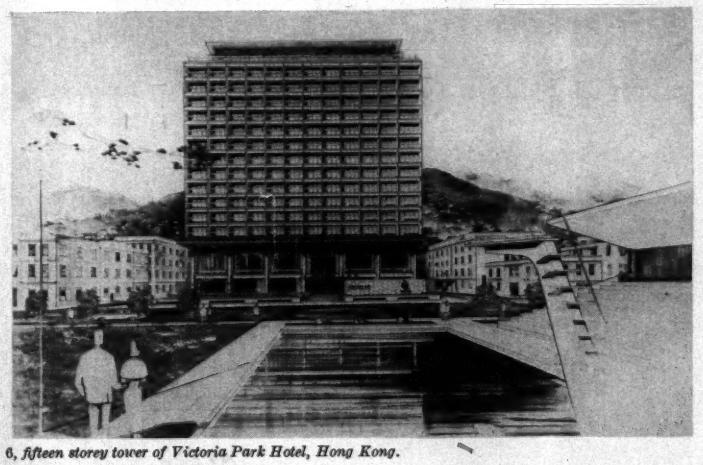
Due to private, rather than official enterprise, the touring exhibition of the work of Le Corbusier, which had already been seen in Zurich, Berlin, Stockholm and other European centres, finally opened to the British public in Liverpool in December, and will now be on view in London, at the Building Centre, Store Street, W.C.1, until March 6. It is not an entirely comprehensive exhibition, since it gives very full coverage to works recently completed or still in hand, but makes a number of conspicuous omissions from his earlier *Oeuvre*—the absence of the *Cité de Refuge* and all the Swiss buildings before 1918 considerably impoverishes the picture given of him.

However, what is shown is well shown, in the form of large photographs, drawings and some excellent models, supported by a number of paintings, sculptures and tapestries, some of which have hitherto been known only from magazine illustrations. Although the works shown are grouped by themes, rather than chronologically, and emphasize certain recurrent strains in Le Corbusier's work and thought, they shed surprisingly little light on the problem of his current changeability of style between the curved plasticity of, for instance, Ronchamp, and the

rectangular slab-construction of, say, the Mill-owners Building at Ahmedabad. What is clear, however, is that a well-known saying of his must now be amended to read 'the secret of my research must be discovered in my painting *and my sculpture*' and the exhibition, by confronting paintings, sculptures and models of his buildings gives a probably unrepeatable glimpse of what that secret might be.

Canada on the China Coast

The 240-room Victoria Park Hotel in Hong Kong, due for completion in 1960, is more than an Hotel Fabulous with a surprisingly English name, it also marks a new stage in Commonwealth architectural co-operation and the emergence of Canada as a power in international architecture, for its designers, in association with Professor Gordon Brown and local architects Wong and Ng, are the increasingly well-known Toronto firm of John B. Parkin Associates. (Recent work by this office was illustrated in November, 1958, AR.) The published perspective shows a block whose fifteen storeys tower above the colonial roof-lines of immediately neighbouring buildings, but there are a number of other developments of this scale in Hong Kong already, while by comparison with Japan, of course, the size is unremarkable. A more instructive comparison with Japan, however, and with the work of Kenzo Tange in particular (*Marginalia*, December, 1958) suggests that the rapprochement between the architecture of East and West may not after all be along the Mies-Katsura axis, but somewhere between Le Corbusier and Oriental monumental, bracketed architecture.



6, fifteen storey tower of Victoria Park Hotel, Hong Kong.

The Art of Re-issuing VIII

Architecture, You and Me (Oxford University Press, 30s.) is a collection of miscellaneous papers by, or addressed to, Sigfried Giedion between the years 1937 and 1956. It originally appeared under the German title of *Architektur und Gemeinschaft*, which is far more apt to the intentions of the book because it avoids the Pop-art and catchpenny implications of the English version. These texts are, in fact, far from catchpenny and the first section of the book, 'The Ruling Taste,' which is chiefly about Ary Scheffer, is specifically anti-popular—the key essay here was begun in 1936, and revised in 1955, and this lapse of time may be responsible for the fact that this is the only piece in the book that contradicts the axiom *Giedion speaks only of the questions of the hour*, for its underlying theme is that Pop taste is wrong, a proposition curiously at variance with the ideas of the Fifties.

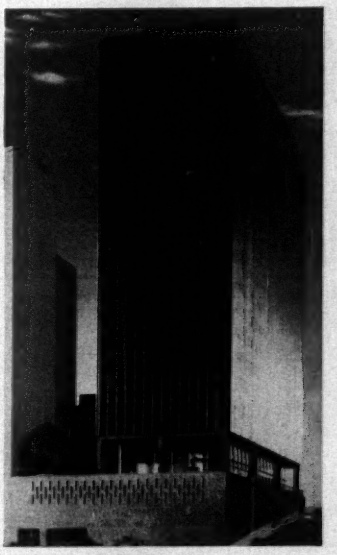
For the rest, the book accurately reflects the questions of successive hours in the post-war history of CIAM—Monumentality in 1945, Integration of the Arts in 1947, East-West politics in 1949, The Core of the City in 1951, the New Regionalism in 1954, Hyperbolic Paraboloids in 1956—and provides an unusually handy guide to the movement of ideas in progressive Western architecture in the first decade of Peace, down to—but not, alas, including—the decomposition of CIAM in 1957, under the influence of younger men to whom Giedion was less an historian than an historical figure. As a proper counterbalance to this, the only section of the book which seems, at the moment, to have any standing more lively than that of an historical document, is the one in which Giedion examines his professional conscience as an historian on the subject of the teaching of architectural history. Though one may not agree with his proposal that the history of architecture be taught as the history of space-concepts, the teaching of history will be the question of many hours to come, and his views as a professional in the field must be heeded.

Architettura Cantiere

Architettura Cantiere, the most serious of the Italian magazines—not to be confounded with Zevi's *L'Architettura*—has recently devoted three whole issues (Nos. 12, 16, 18) to the work of Ina Casa. Ina stands for the Istituto Nazionale Assicurazioni and Casa stands for casa on a very large scale. The institute is a State Agency, the daughter institute for the building of housing estates an independent body working with Government funds. As in Italy the building of estates of low-rental flats is not carried on by the cities and provinces themselves, Ina Casa has taken their place. Their estates are to be found everywhere in Italy. They range from minor infillings to housing for populations of 4,000 and up to 6,000 (Cesate, Milan) and even 10,000 (San Giuliano, Marghera-Mestre), and what makes Ina Casa the most remarkable housing agency in Europe is the fact that their estates are designed consistently by good architects in private practice. There are estates by BBPR, by Albini, by Figini & Pollini, by Paniconi & Pediconi, by Gio Ponti, by Vaccaro, by Quaroni, by Daneri, etc., etc., and amongst consultants brought in, there are Piccinato and Samonà. In addition—which is perhaps even more remarkable—there are any number of minor names who, with the help of Ina Casa, get a chance of putting work before the public on a scale not otherwise available in Italy. Some are rationalists, some are anti-rationalists, some are brutal, some are smooth, some are villagey, some are urban. The only thing that they hardly ever seem to be is landscape-conscious. Otherwise these three issues of *Architettura Cantiere* are a pattern book of modern estates and would well deserve to be available as a book in this country. We are short of literature on good high density housing.

The Norton Building

At first sight, 7, a regular US office-building in the now established curtain wall vernacular idiom, distinguished from its peers and equals chiefly by careful detailing and lavish technical equipment, the Norton Building in Seattle, designed by Bindon and Wright (with Skidmore, Owings and Merrill) contains an important innovation which may or may not be taken up against the grain of recent American structural thought. Apart from the lift and services stack there are no fixed vertical internal structures at all, and by using deep pre-stressed concrete floor-beams it is possible to offer tenants clear office floors seventy feet square on either side of the core, and seventy by thirty in front of it. It remains to be seen, of course, whether unlimited freedom in plan that this offers will ever be fully exploited, or whether service outlets will, in practice, impose a limiting module by their location on a five-foot-square grid.



7, glass tower in Seattle.

Tattersall's Concrete Horses

The customary praise, for having commissioned public architectural sculpture by a living artist, can be reinforced in the case of the group of horses on Caltex House, Knightsbridge, 8, by Franta Belsky, with praise for the topographical appropriateness of the iconography (the building occupies the site of Tattersall's, a name to conjure with in horse-racing) and for the technique employed. Not a separate work of art, balanced on or clamped to the building, it takes its origin from a purpose made r.c. column integral with the main structure. To this column were attached the reinforcing rods that form the skeleton of the sculpture,

8, side view of Belsky's horses.

which in their turn were skinned in expanded metal and lathing to form the key for the trowelled-on cement that gives the visible form of the sculpture. The final surfacing is in burnished and wire-brushed plastic metal.

Correction

Apologies are due to Mr. K. Lint for the misspelling of his name on page 326 of the November issue.

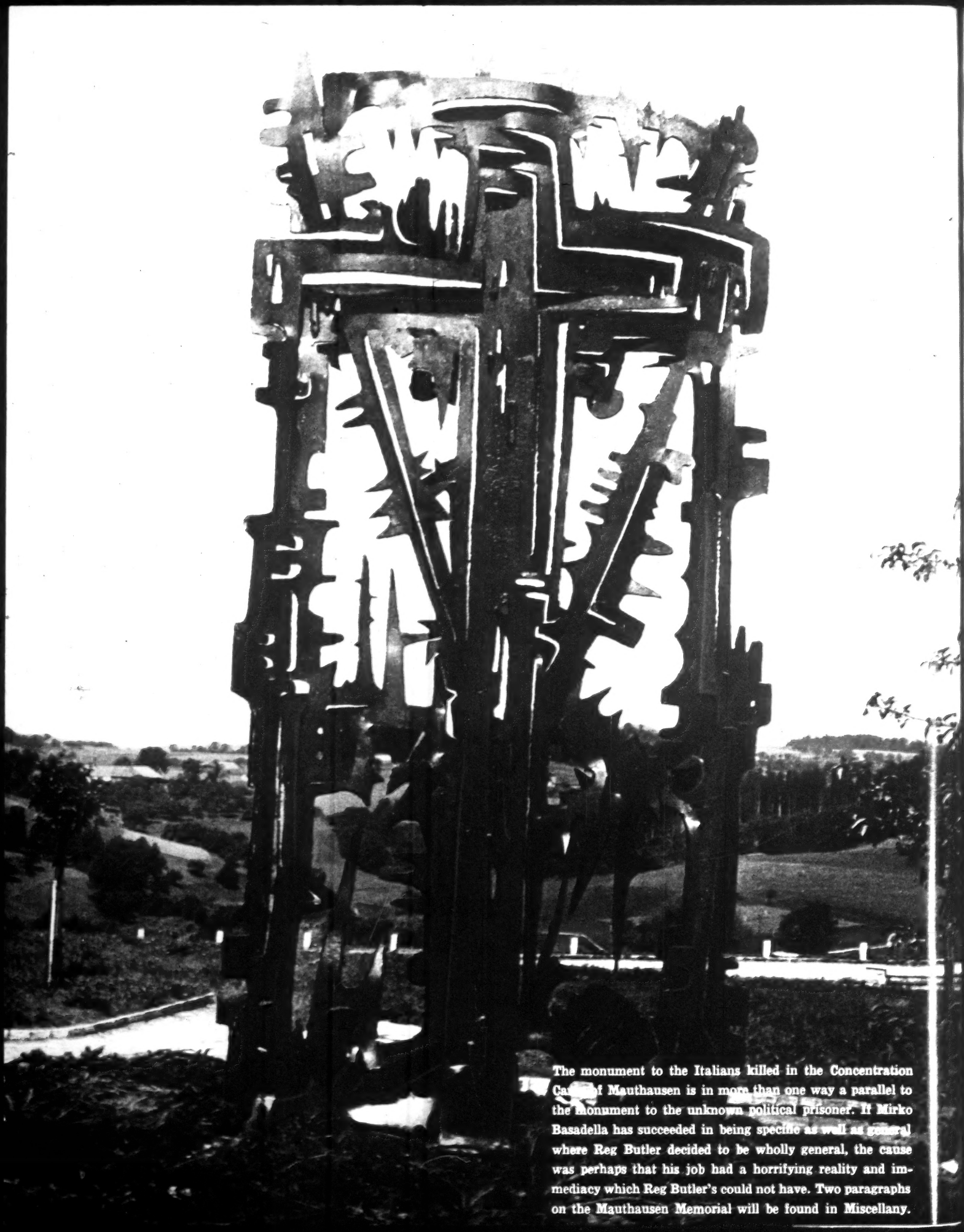
Intelligence

Leeds University announce the appointment of Mr. Peter Chamberlin, of Messrs. Chamberlin, Powell & Bon, as Consulting Architect to the University from December, 1958.

The Institute of Landscape Architects, of 1 Park Crescent, Portland Place, W.1, is contemplating setting up a landscape Design Centre at their premises. To assess the demand for such a centre they request anyone interested in taking advantage of it to write to the Secretary.

ACKNOWLEDGMENTS

MARGINALIA, pages 83–85, 1–5, Architecture & Building; 6, John B. Parkin Associates; 8, Godfrey MacDominic. HOSPITAL IN BELFAST, pages 90–93, Galwey, Arphot. BRASILIA, pages 94–104, Humberto and José Franceschi, Marcel Gauherot and Peter Scheier. SOLAR SUN MILL, pages 105–107, 6, Aluminium Co. of America. SPAN, pages 108–120, 5–11, 13, 17–19, 23–25, Peter Pitt; 12, 14, 20–22, Toomey, Arphot; 15, 16, 26, Sam Lambert. INTERIOR DESIGN, pages 121–125, House for the Principal of Newnham College, Raymond Wilson; Offices in Berkeley Square, 9, 11, 13, 14, Toomey, Arphot; 10, 12, John Maltby. DESIGN REVIEW, page 126, 1, Strüwing Reklamefoto; 2, 3, Edinburgh Weavers; Carr in Portugal, frontispiece and 1, Photografia Atvas. CURRENT ARCHITECTURE, pages 129–130, 1, 2, Paul Forster; 3, Hans-Dieter Haren; 4, 5, Pickard of Leeds; 6–8, Galwey, Arphot. UNIVERSITY OF NIGERIA, pages 132–136, 1, 2, Alfred Cracknell. MISCELLANY, pages 137–144, Exhibitions, 3, Newport-Givilt; 4, Tomorrow's News; 5, R. B. Fleming & Co. Ltd. and The Arts Council of Great Britain; 6, Lord's Gallery; 7, 8, James Mortimer and The Arts Council of Great Britain; 9, Lee Krasner Pollock; 10, Mrs. H. Gates Lloyd. Jacobsen, pages 140–142, 1, 2, Niels Berg; 3, 7, Strüwing; 5, Finmar Ltd.; 6, Erik Hansen. THE INDUSTRY, 2–3, Northern Aluminium Co. Ltd.; 6, TAF (International) Ltd.



The monument to the Italians killed in the Concentration Camp of Mauthausen is in more than one way a parallel to the monument to the unknown political prisoner. If Mirko Basadella has succeeded in being specific as well as general where Reg Butler decided to be wholly general, the cause was perhaps that his job had a horrifying reality and immediacy which Reg Butler's could not have. Two paragraphs on the Mauthausen Memorial will be found in Miscellany.

Reyner Banham

THE GLASS PARADISE

As research into the motivations of modern architecture proceeds, unacknowledged pioneers are being brought to light whose contributions must be set beside those of the masters who have already been written into the record. Outstanding among the missing pioneers is Paul Scheerbart, a Berlin literary bohemian who died in 1915 *and, as Reyner Banham shows in the article below, a man with a strong claim to be regarded as the true prophet of all-glass architecture.*

The public were less surprised by Lever House than was the architectural profession—and this was logical, for had not a massive body of opinion-making machinery been telling them, since the mid-Twenties, that modern architecture was just a lot of glass boxes? Architects, on the other hand, knew that between the glass legend and the concrete fact there was a great gulf fixed—a gulf forty years wide and as deep as the building industry.

In spite of near-misses like Gropius's *Faguswerke*, and any number of exhibition buildings, in spite of Mies van der Rohe, Lever House was still the first of the glass towers to realize a seminal concept that has lurked in the mind of the Modern Movement since before the first World War. The reasons for this extraordinary lack of phasing may be traced back to the Movement's own view of itself, and particularly to its tendency to try and tidy up its own history as it goes along.

The respectable genealogy of the glass legend is primarily the work of two men: one was Hermann Muthesius, father of the *Deutscher Werkbund*, who wrote in his *Stilarchitektur und Baukunst* of 1902, of the beauties of the Crystal Palace and the Galérie des Machines, station halls, covered markets, and most of the totemic objects of the glass dream—a pioneer re-assessment of the nineteenth century. The other is Sigfried Giedion, whose *Bauen in Frankreich* of 1928, related the architecture of his contemporaries back to Muthesius's canon of nineteenth-century masterpieces, and interpolated, with great historical subtlety and erudition, a philosophy common to both. His contemporaries were, of course, delighted to find that they were following such distinguished precedents, most of which were unknown to them until they opened the book.

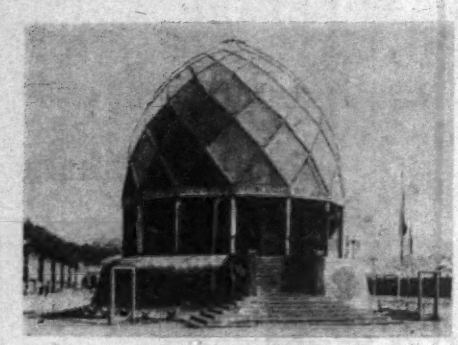
But if these precedents were, in practice, unknown to them, what precedents did they follow, what motives drove them? What, in fact, had been said and done to further the glass dream between 1902, when Muthesius pointed the way, and 1929, when Giedion's book was shortly followed by others by e.g. Artur Korn or Konrad Werner Schulz, which dealt specifically and exclusively with glass in building.

One can point first to two respectable contributions, Meyer's *Eisenbauten*, before the first World War, and the *Ingenieurbauten* of Lindner and Steinmetz after it, which both drew attention to buildings of the type originally praised by Muthesius, but were not particularly slanted toward glass. One sees also that Bauhaus teaching, and the example of the Bauhaus buildings in Dessau must have turned men's minds in the direction of transparent membranes, even though Le Corbusier's first *pans de verre* were still, so to speak, around the corner of a white rendered wall. But in all these there is no sign of the singing tones of prophecy, the incantatory repetitions that give a material those symbolic powers, over and above the recommendations of reason, that make it a live component in architecture.

It is to Germany, in the months immediately preceding and immediately following the first World War, that we have to turn to find that prophetic tone, to the period bracketted by the completion of the glass wall of the *Faguswerke*, late in 1913, and the second, 1920, glass-tower project of Mies van der Rohe. Both of these are accounted works of the party of reason, yet both, on examination, are found to have some curious cousins. Mies's glass-towers have been justly called Expressionist, while their contemporaries, from Gropius's side, include the first Bauhaus proclamation with its gushing rhetoric about buildings 'like crystal symbols,' and a three-spired gothic cathedral on its cover.

All this is commonly written off as an aberration due to 'Post-war Berlin.' But if it was, then it was an aberration that gripped a generation, and must have more in it than meets the eye. In fact, there is a great deal in it, a great deal of the Modern Movement's disreputable ancestry, but as far as the glass legend is concerned, there are two dominant strains, both traceable back to the Werkbund's exhibition in Cologne in 1914. The importance of that exhibition for the glass dream is known, and acknowledged in every history by an illustration of one of the staircases of Gropius' office block in its glass hemicylinder. But that is only half the story.

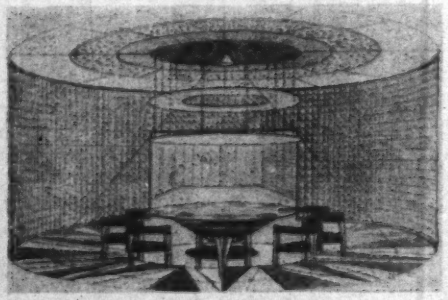
There was also at Cologne for that exhibition a pavilion devoted to the glory of glass exclusively, a pavilion that demonstrably had a far greater immediate effect on the imagination of German architects than Gropius's did, for sundry descendants of it can be identified in designs done after the war, including Mies's first, faceted design for the Friedrichstrasse skyscraper. This pavilion cannot be comfortably fitted into the history of the modern movement—particularly if that history, like Giedion's, is slanted for continuity—because it is so wrong for its time: a primitive geodesic dome of steel and glass, raised on a drum of glass bricks containing staircases with



1, *Bruno Taut: Glass Industry Pavilion*, 1914.

glass treads and glass risers, a design imbued with the homogeneity and visual certainty that Gropius's office block so conspicuously lacks, even allowing for differences in function and form.

The Glass Pavilion was the work of Bruno Taut, and so far exceeds every other design from his drawing board that one may properly enquire what lies behind it. The clue is given by Konrad Werner Schulz: it was *Paul Scheerbart gewidmet*, and this Paul Scheerbart was *der literarischer Vorläufer und Anreger moderner Glasarchitektur*. Now, the statement that the literary forerunner and instigator of modern glass architecture was Paul Scheerbart will probably come as a complete surprise to English-speaking readers and to many



2, *Bruno Taut: project for glass dining room*, 1923.

German-speakers as well. In German architectural literature his name is unknown outside the works of Schulz, Platz (two brief references in his *Baukunst der neuesten Zeit*) and some forgotten books by Bruno Taut. In English, there is a glancing reference in Giedion's *Walter Gropius: Work and Teamwork*, but not a word in *Space, Time and Architecture*.

The oblivion into which Scheerbart's name has fallen suggests—and how rightly—that he is not to be numbered among Modern Architecture's respectable ancestors. Handbooks of German literature, unanimously unaware of his architectural interests, record an almost spherical bohemian layabout—and Kokoschka's portrait confirms this—a fringe-member of the Futurist-Expressionist *Sturm* group, born in 1863 and dead in 1915, the author of fantasticated novels, mostly short and decorated by his own hand in Yellow Book style. Many of these novels can best be described as contra-science-fiction, astral pantomimes, moon romances, astral novelettes and what-have-you. Beyond this, his output included appendices to the Munchausen legend, Harem romances, an *Eisenbahnroman* that appears to be the pioneer of that genre of literature whose chief ornament is the *Madonna of the Sleeping Cars*, a 'Hippopotamus' novel (of which more in due course), and a telegraphic romance called *The Mid-Ocean Hay-fever Sanatorium*, in whose very title one perceives something of the vein of practical logic that runs through his one work specifically devoted to the arts of building, *Glasarchitektur*, published in 1914.

Dedicated, as one might have guessed, to Bruno Taut, it is a slim, soberly-presented volume, quite unlike his novels in typography and format, and runs about a chapter to a page—some of the chapters no more than single thoughts noted in a couple of sentences—for 125 pages. These chapters are only loosely connected, though not much more loosely than those of Le Corbusier's *Vers Une Architecture*, and like that work they expound an unpredictable mixture of uninhibited vision and sharp practicality. Both the vision and the practicality draw their strength from the things that Scheerbart knew at first hand or had seen with his own eyes—glazed verandas, palm-houses, public halls, searchlights, zeppelins, sanatoria, mirror-panelled café interiors, theosophist publications, the Cologne pavilions of Taut (explicitly) and Gropius (by inference), and much more besides. The vision he offers is a compound of all these, torn from their contexts, and re-assembled by a mind unrestrained by conventional ideas and received opinions, but buttressed by a shrewd idea of what will, and what won't work.

> The vision of a glass world
> . . . as entirely delectable as the gardens of the Arabian Nights . . . a paradise on earth . . . we shall show no longing for the paradise of heaven

begins with something that was common knowledge to Scheerbart and most of his readers, the glazed conservatory. This he envisaged becoming ever larger and more important until it had to be emancipated from the house, and set up independently in the garden. The glass-world citizen then abandons his old house and moves into the conservatory, which is aesthetically linked to the garden (floodlit at night) by glass walls and screens that extend its structure into its surroundings. As a habitable environment, the conservatory-house, which Scheerbart seems to envisage as something like Taut's glass pavilion, has double walls of coloured glass carried in a reinforced concrete frame clad in mother of pearl or mosaic. Its floors were to be of coloured ceramic tiling, its furniture of glass with brightly enamelled steel legs and upholstery of glistening glass-fibre cloth. Artificial light was to enter the rooms from sources between the double-glazing, and from hanging lamps of oriental style, the heating under the floor.

The landscape in which the jewel-like house and its floodlit garden are situated is to be a diffuse metropolis, with air-navigation beacons winking from the tops of its taller buildings. Illuminated trains, cars and motorboats, like blazing jewels traverse the night scene, while overhead, zeppelins, brightly-lit themselves, and shedding light over the land, cruise toward an air-terminal in a park of experimental glass buildings, one of which is a hangar whose roof-space is occupied by an exhibition of models of historic airships, all with their own miniature lights ablaze. The shore line of the Swiss lakes, the outlines of the smaller Alps are picked out in brilliantly lit glass hotels, the summits of the higher peaks are floodlit in colour. Venice—or a new movable Venice—is a cluster of huge pyramidal buildings, glazed and illuminated and doubled by their reflections in the calm sea. Tourists, no longer hurrying from distraction to distraction, move calmly from the contemplation of one glass wonder to another.

About this vision certain things need to be said. Its inspiration was certainly personal—Scheerbart, it appears, was often poor, cold and miserable in squalid surroundings, and had an acquired hatred of the ill-lit and oppressive atmosphere of congested masonry cities. Hence the diffuse planning of the glass dream-world, the gardens and the greenery. Hence, too, the dedicatory motto he pronounced at Taut's Cologne Pavilion

> Das Glas bringt uns die neue Zeit
> Backsteinkultur tut uns nur Leid
> (Glass brings us the new age
> Brick culture does us only harm)

and his insistence that the 'metropolis in our sense' must be dissolved. But Scheerbart, unlike some of the glass-enthusiasts of later generations, was under no illusion that glass was in itself a universal panacaea. He had too much practical sense for that, and knew the weaknesses and side effects of its use. He knew that it was all too pervious to heat, and insists frequently on the need for double glazing. He knew also of the green-house effects it can produce, and insisted that glass architecture was for the temperate zones, and not the tropics nor the polar regions. He knew that his call for *Mehr Farbenlicht!*—More coloured light!—that runs through the whole book, could only reasonably be answered when electricity was more cheap and plentiful than at the time he wrote. When hydroelectric power came in, he prophesied, then even

private persons will have floodlighting in their gardens. He knew from Taut that the making of convincing models of glass buildings awaited more tractable materials than the picture-glass and brass strip then in use, and looked forward to developments in transparent plastics (he names a forgotten proprietary product: *Tektorium*). Beyond that again, he looked forward to even better materials than glass for full-size buildings, and identified laminated glass (zwischen zwei Glasplatten eine Zelluloïdplatte) which had only just come in, as an example of what should be looked for from a lively and developing technology, for

> We stand at the beginning, not the end, of a culture-period.
>
> We await entirely new miracles of technology and chemistry.
>
> Let us never forget it.

This optimistic view of technology puts him at one with the Futurists, whose works he certainly knew, and in this, as in his long-range prophecies, he is clearly of the party of progress, a member of the mainstream of modern architectural thought. Where he is conspicuously outside that mainstream is in the detail aesthetics of his vision. Whether or not he knew any Tiffany interiors, he certainly knew and admired individual pieces of Tiffany glass, and its aesthetics, notably the nuanced colours that he calls *die Tiffany-Effekte*, inform many of his visualizations. To this must be added an insistence on ornament based on mineral forms and vegetation—perhaps like Louis Sullivan's—and a strong strain of conscious orientalism that directs his thoughts on light fittings, cloths and fabrics, floor coverings, tile-work and so forth.

Here, in fact, we see him headed against the supposed tide of Modern Movement ideas. As Charles Mitchell pointed out some time ago, the idea of good modern design for which we have settled is a profoundly classical idea, in opposition to the anti-classicism of much nineteenth-century thought. Scheerbart was no classicist, and for an entirely logical reason: *Hellas ohne Glas*—Greece without Glass. Equally logically he admired those cultures that delighted in coloured glass, in the Orient and in Gothic Europe. Equally logically again, he combated the classicist polemics of Adolf Loos (by implication if not by name) against ornament.

But—and still perfectly consistently—he also saw Gothic architecture as the true forerunner of the great glass and iron structures of the nineteenth century that he admired quite as much as Muthesius ever did, and in this linking back of the *Grands Constructeurs* to the Gothic spirit, he is at one with the French Rationalist tradition from Viollet-le-Duc to Auguste Choisy, the tradition that produced most of the buildings that were featured in *Bauen in Frankreich*. Again, his orientalisms, gothicisms, his interest in theosophy and light-mysticism, which all seem a mile away from mainstream modern movement ideas, are no distance at all away from the frame of mind in which Johannes Itten created one of the greatest glories of the modern movement, the Bauhaus preliminary course. The Bauhaus connection cuts even closer than this—much of the text of the first proclamation, where it deals with eliminating the barriers between brain-worker and artisan, directly echoes the apocalypse of Scheerbart's *Immer Mutig* (the Hippopotamus novel referred to above) where

> Kings walk with beggarmen, artisans with men of learning

and the three-spired cathedral in Lyonel Feininger's woodcut on the cover is now seen to be topped, not—as has been supposed—by three stars of Bethlehem, but by three navigation lights for Zeppelins.

One could pursue the matter further, into the ever-ramifying but ever more attenuated influence of Scheerbart as it runs on into the Twenties—including perhaps the glass towers of Le Corbusier's *Plan Voisin de Paris*, for they are close cousins to Mies's Friedrichstrasse project, and their form with emphatic vertical accents was later written off by Le Corbusier as a mistake peculiar to German architecture. But the mere pursuit is not the point—it is the necessity and attractions of the pursuit that are the point. Why, in a word, do we have to re-write the history of the Modern Movement?

Not because that history is wrong; simply because it is less than lifesize. The official history of the Modern Movement, as laid out in the late Twenties and codified in the Thirties, is a view through the marrow-hole of a dry bone—the view is only possible because the living matter of architecture, the myths and symbols, the personalities and pressure-groups have been left out. The choice of a skeletal history of the movement with all the Futurists, Romantics, Expressionists, Elementarists and pure aesthetes omitted, though it is most fully expressed in Giedion's *Bauen in Frankreich*, is not to be laid to Giedion's charge, for it was the choice of the movement as a whole. Quite suddenly modern architects decided to cut off half their grandparents without a fathing.

In doing so, modern architecture became respectable and gutless; it entered on what Peter Smithson has justifiably called its Academic phase, when it became a style with books of rules, and could be exported to all parts of the Western world. But having set itself up as something more than a style, as a discipline of pure reason, it had to double-talk fast and frequently to explain its obsession with certain materials, particularly glass and that smooth white reinforced concrete that never existed outside architects' dreams and had to be faked in reality with white rendering. Clearly, these materials were symbolic, they were totemic signs of power in the tribe of architects. But while concrete has never lacked respectable medicine-men, from Auguste Perret to Pierluigi Nervi, to maintain its *mana*, the image of Gropius as the official witch-doctor of glass has never looked very convincing. On the other hand the fanaticism of a Bruno Taut possessed by the spirit of Paul Scheerbart, as by a voodoo deity, has much more the air.

This is not to say that we now throw away the history of glass in modern architecture as it has been established so far—the position of Muthesius and Gropius among its prophets is not demolished, only diminished. We have to find some space for Scheerbart, as Giedion now clearly recognizes. The problem, which is not to be settled by a single article, is—how much space? As to his right to that space there can be no further doubt, for if one applies to him the normal test for missing pioneers, that of prophecy uttered in the right ears at the right time, he scores more heavily than many other writers of his day. Not only were his architectural writings known and in varying degrees influential among the generation of Gropius and Mies van der Rohe, but at a time when many spoke of steel and glass, he also spoke of water as the natural complement of glass, of the need to temper the white glare of light through glass by the use of coloured tinting, he spoke of America as the country where the destinies of glass architecture would be fulfilled, and he spoke of the propriety of the 'Patina of bronze' as a surface. In other words, he stood closer to the Seagram Building than Mies did in 1914. To put him back into the history of modern architecture is to shed upon it precisely what he would have us shed upon it—*Mehr Farbenlicht!*

3, portrait of Paul Scheerbart, by Oscar Kokoschka.

Probably the most thorough programme of functional research into any problem of architecture or planning to date, was the Nuffield Provincial Hospitals Trust's *Investigation into the Functions and Design of Hospitals* led by Richard Llewellyn Davies. Its findings were embodied in a book that is a classic of its kind, *Studies in the Functions and Design of Hospitals* (Oxford University Press, 1955) and in two experimental wings to existing institutions, the Nuffield Wing at Larkfield Hospital, Greenock, and Nuffield House, Musgrave Park Hospital, Belfast. These were designed by the body which has succeeded the *Investigation*, the Division for Architectural Studies. The Larkfield scheme was described in the *Studies;* the Belfast building is illustrated in the pages that follow.

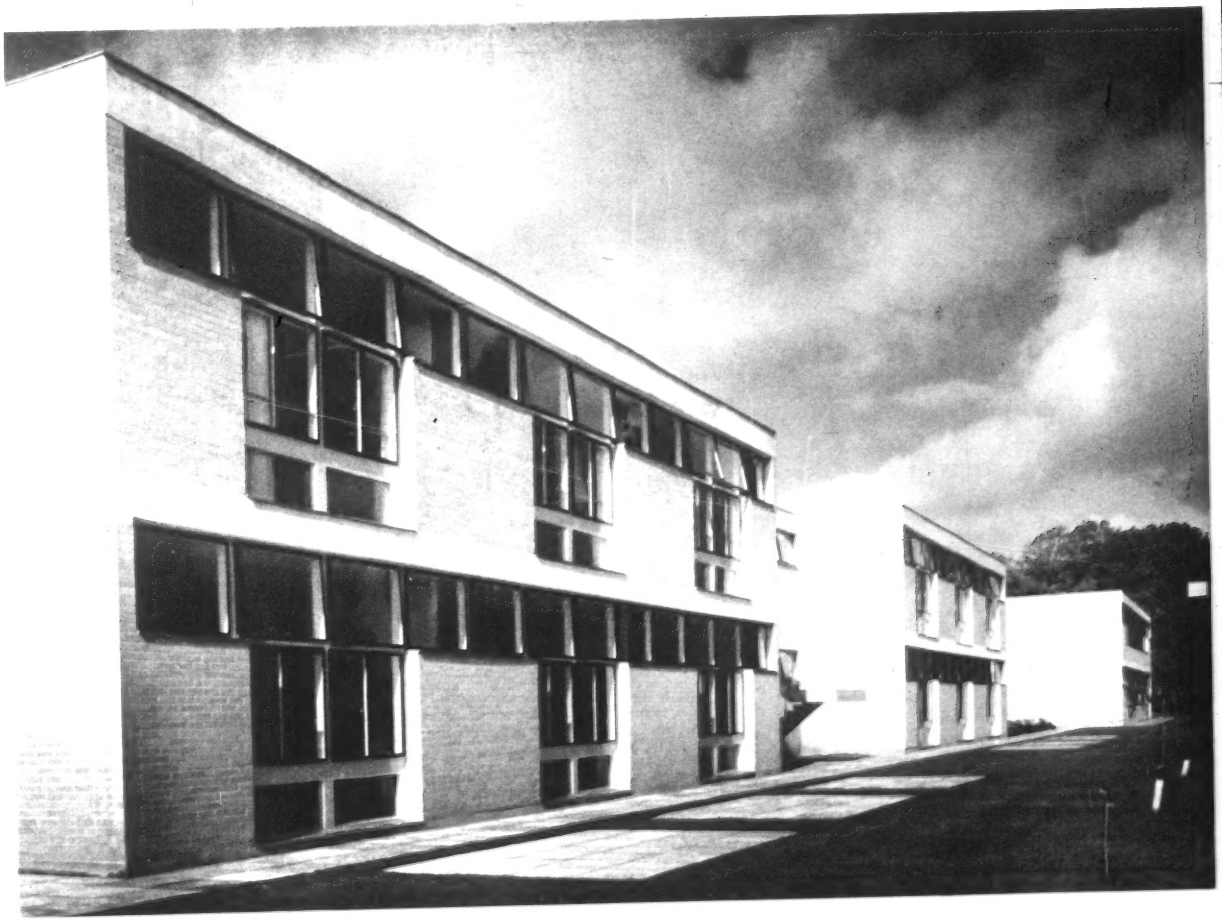
HOSPITAL NEAR BELFAST

key

1. entrance hall.
2. sister's office.
3. doctors.
4. X-ray waiting room.
5. X-ray.
6. workroom.
7. reception.
8. trolley parking.
9. radiologist.
10. receptionist.
11. radiographer.
12. dark room.
13. sterile store.
14. autoclave room.
15. general anaesthetic supply
16. barium kitchen.
17. kitchen.
18. rosmery bay.
19. operating theatre.
20. anaesthetic room.
21. supply room.
22. lay-up room.
23. sink room.
24. nurses.
25. surgeons.
26. conference room.
27. laboratory.
28. ward.
29. single room.
30. nurses' station.
31. bathroom.
32. dayroom.
33. treatment room.
34. bogie.

HOSPITAL NEAR BELFAST

ARCHITECT | **RICHARD LLEWELYN DAVIES**



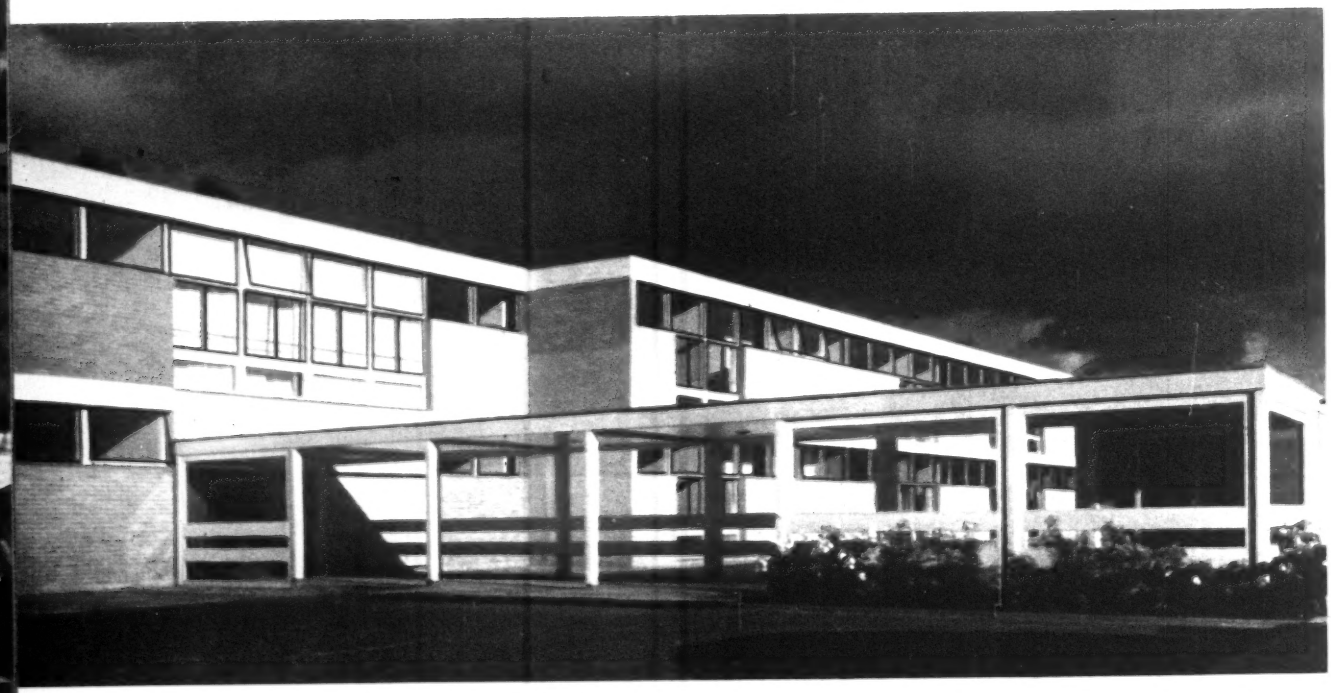
View from the south-east showing the access of patient traffic, other [illegible] the deep wards

Nuffield House, for surgical patients, is the second of two research projects on hospital design undertaken by the Nuffield Foundation. It contains two identical ward units, one above the other, occupying the southern block, with the north block containing an X-ray department, a central sterile supply department serving the whole hospital of about 700 beds, and a twin operating-theatre suite.

2

Now the ideas on the design of hospitals have been incorporated; teams of nurses care for groups of 20 patients to give more personal attention and provision is made for patients who are out of bed to have comfortable sitting spaces and better washing facilities. The main ancillary rooms are at the centre of the ward unit with the beds as close to them as possible and the artificially ventilated and lit toilet rooms in the depth of the buildings. This resulted in shorter, thinner blocks than usual and led to considerable economies.

A reinforced concrete frame structure has been used and the construction of the floor and roof slabs was designed so that vertical services could be introduced at any point without alteration to the main frame.



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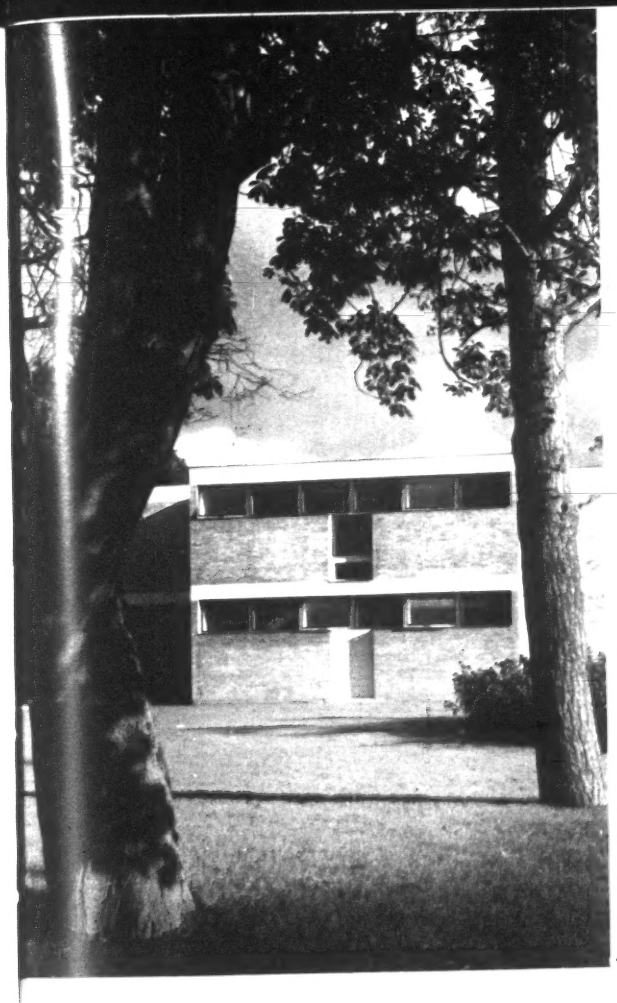


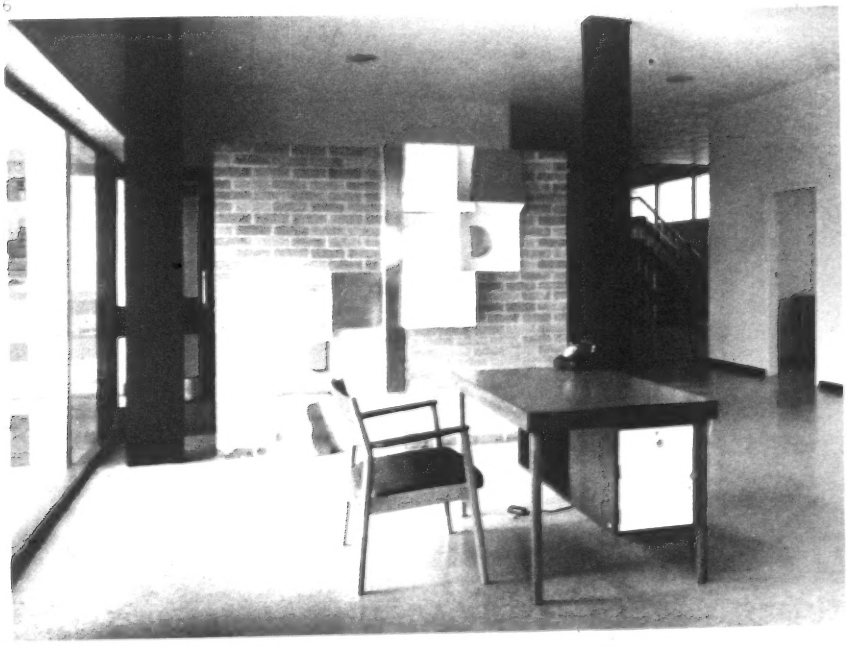
4

HOSPITAL NEAR BELFAST

structure. A 5 ft. module was used, with the main structural bays of 20 ft. by 10 ft. All main partitions are built in two skins, 6 in. apart, and services run vertically between them. The external walls are of cavity construction, with the edge of the floor and roof slabs exposed on the face of the building. The roof is insulated with a 2 in. layer of cork. The ventilation plant, lift motors, and horizontal services are housed in the basement. Colours externally and internally are very light tones of grey, with exposed structural columns painted black to express the building's skeleton.

5

The architect worked with the team at the Nuffield Foundation Division for Architectural Studies.



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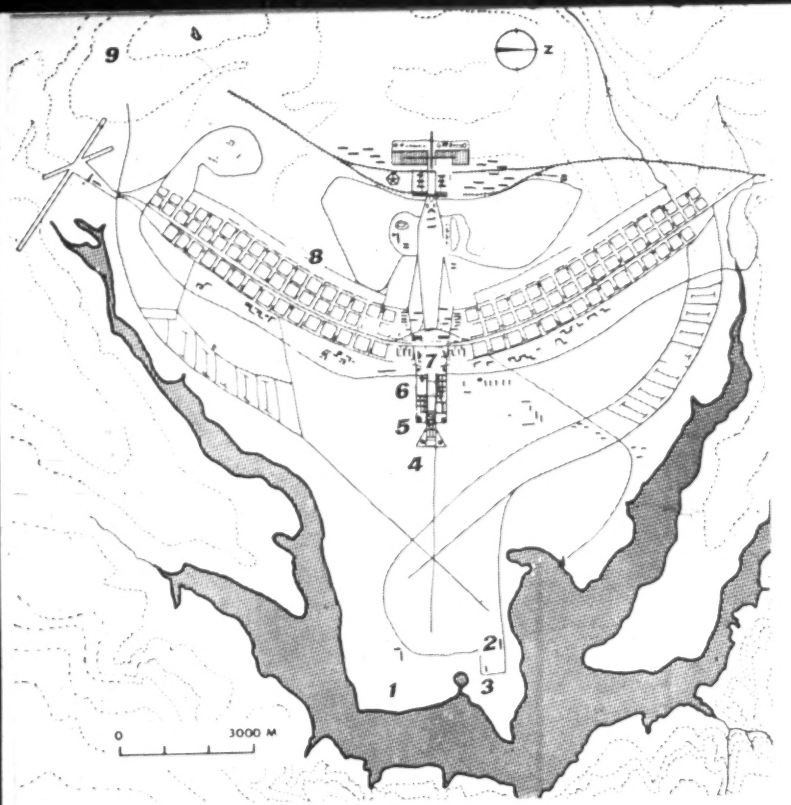
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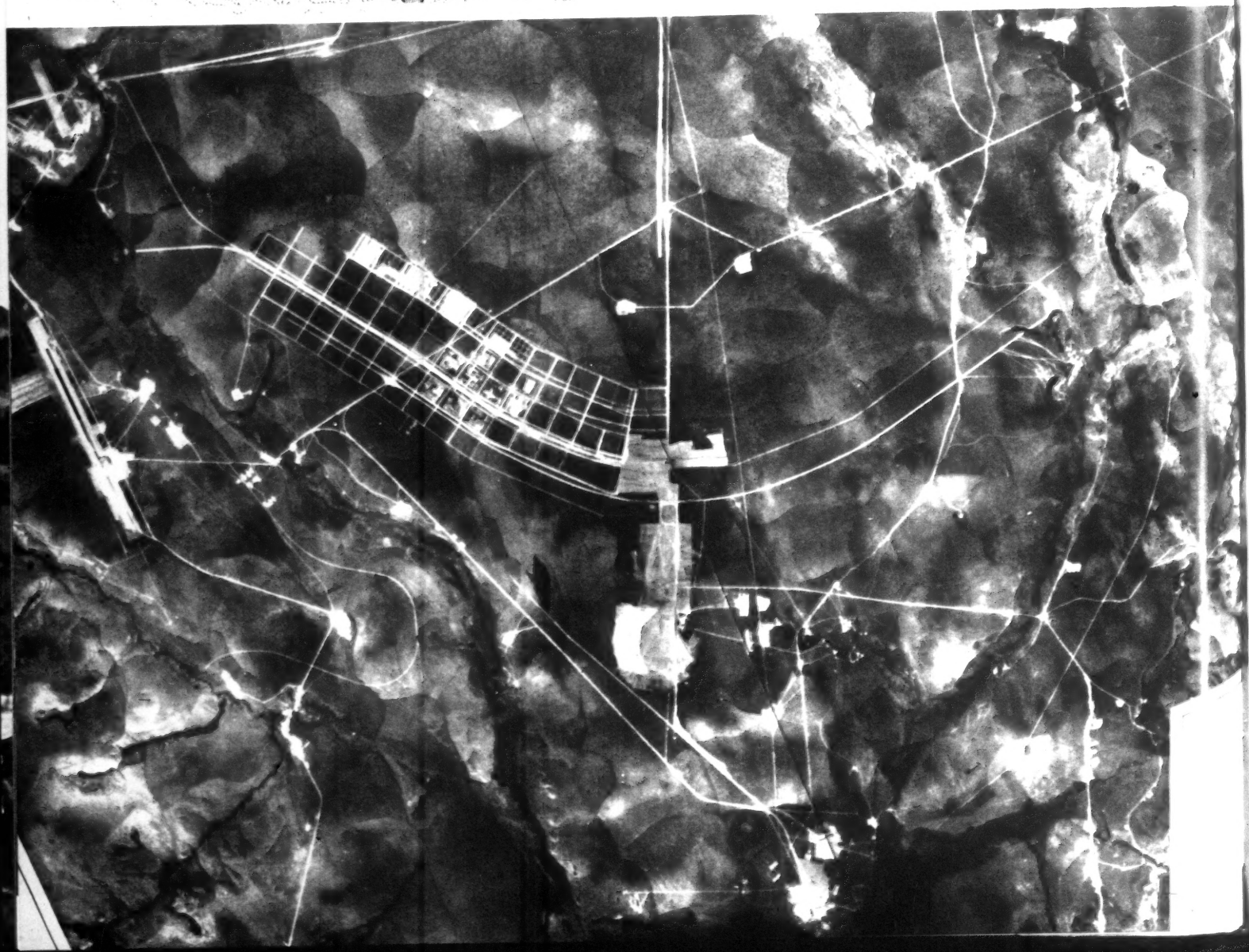


J. M. Richards

BRASILIA

Lucio Costa's master-plan for the new Brazilian capital, 600 miles north-west of Rio de Janeiro, was described and illustrated in the REVIEW *for December, 1957, in an article by Sir William Holford, who was a member of the international jury which earlier that year had awarded Costa first prize in the competition for the plan. Construction began forthwith, under the architectural direction of Oscar Niemeyer, and the city is already taking shape on the ground, as the air-view opposite shows. On the following pages are an account of progress to date, a preview of Niemeyer's designs for some of the principal buildings and illustrations of the two important buildings already completed by him, an hotel and the President's palace.*

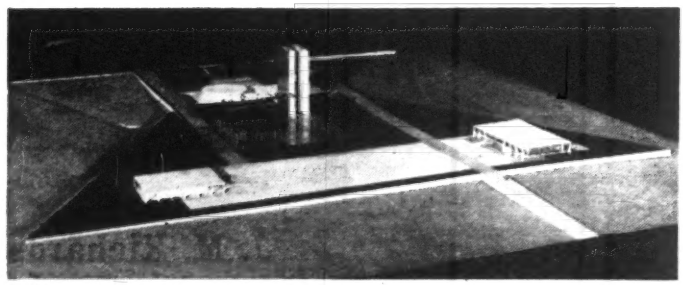
Building activity is concentrated just now on two sites, some two and a half miles apart, one at the eastern end of the main axis, where the parliament buildings are under construction, and the other in the residential belt, where eleven of the square blocks of which this belt consists are in various stages of construction. These are about a third of the way along the southern arm.

Elsewhere on the site of the future city—an area of about sixty square miles—the ground is still covered with its original vegetation, a fairly sparse low-growing scrub dotted with small twisted trees not big enough to obscure the bright red earth between. Apart from the newly built highway that links Brasilia with the outside world (the nearest town, Anapolis, was 75 miles away), the site is of course criss-crossed with roads—mostly as yet unmetalled—and there is an enormous amount of completed work in the way of water and power supplies, drainage systems and so on not visible to the eye.

It is otherwise fairly featureless except for a distant rim of mountains in every direction. Its shape is a plateau with only minor undulations, rising slightly towards its centre. It will have much more character when the lake which is to enclose it on two sides has been created. This will be done by damming a couple of streams that meet nearby. The barrage which will effect this is under construction and will be finished next year, but it will take a whole rainy season after that (December to March) for the lake to fill. The lake will also provide a useful head of water for hydro-electric power, supplementing the rather meagre supply that now comes from a single fuel-operated station.

Beside the shore of the future lake, near where its two arms will join, are sited the two major buildings already completed: the hotel and the President's palace. They are about a quarter of a mile apart and just north of the extreme eastern end of the main axis. The hotel (see page 104) has a simple unpretentious character such as befits a building that will not eventually have so important a role to play in the life of the city as it has for the time being—when hotels grow up in the central area it is likely to become a lakeside holiday hotel or country club. But it has the advantage of spacious planning on a scale that a building restricted, as most hotels are, by the economics of land values cannot normally afford; it is not normally practicable, for example, to have all the bedrooms along one side of the corridor only and the public rooms in a spreading single-storey wing. The equipment and decoration of the bedrooms and public rooms is of the highest standard.

The President's palace (pages 97–101) is a more consciously monumental conception, and Niemeyer has managed to give it a nobility of character rarely



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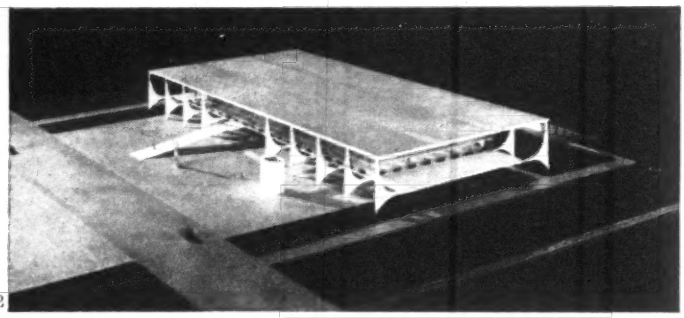


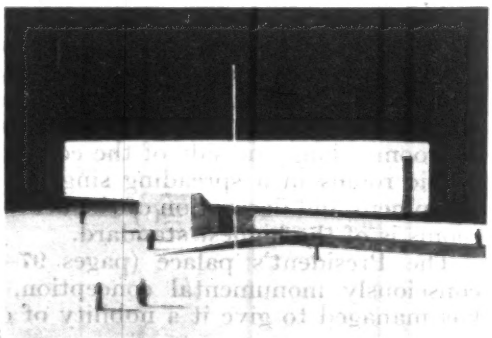
2

Model of Niemeyer's design for the government centre (3 on plan, page 94). The parliament buildings, comprising twin-slab secretariat, Senate and Chamber of Deputies, which have already been previewed (AR, December, 1957), are under construction. Soon to be started are the two buildings at either end of the long paved platform, the President's on the left, offices above, picturesque and the Supreme Tribunal.

achieved in a frame-and-glass idiom. The at first sight somewhat eccentric shape of the marble screen, which partly supports the outer edge of the surrounding verandah and serves also to throw patches of shade across its floor, discloses itself in practice as a most successful architectural device. It gives the palace a slightly grander than domestic scale, and redeems the austerity of its general lines not only by the introduction of these dipping curves, but by adding sparkle and vitality to the whole structure through the fall of light on the surfaces and edges of the subtly modelled marble.

The way the palace, with its verandah, is poised above the ground it sits on and reflected, when seen from the approach road, in shallow pools adorned with sculpture, adds to its dignity. The only weakness in the design is the uncertain handling of the end elevations (5 on page 98). The scale of the circular chapel, which stands on a square platform extended from the end of the building at the level of the verandah, has also been criticized. Photographed separately it does perhaps look as though it ought to be bigger than it is, but the eye is not in fact disturbed by its scale and it is happily enough related to the rest of the palace.

On the paved platform seen above, connecting the Presidential offices with the Supreme Tribunal, is to stand a stone monument, right, commemorating the inauguration of the new capital.



3

Inside there is a wonderful sense of space, with an appropriate change of scale between the magnificent suite of reception rooms on the ground floor and the living quarters occupying an upper floor at either end of the building. The interior daylighting successfully eliminates glare. The finishes are beautiful. The sumptuous furnishing is by the architect's daughter.

The present startling contrast between the elegant sophistication of this building and the primeval landscape that reaches from all directions right up to its doors will of course become less as the landscape is tamed, gardens are planted and the future lake-shore defines the edge of its site. But the palace has been designed nevertheless to stand permanently in an open verdant setting, detached from the built-up area of the town.

Approaching it from the direction of the palace, the town proper begins with the group of parliament buildings, 1, (previewed in December, 1957), of which the construction is already well advanced. They rise above a rectangular platform and consist of three elements: a twin-slab secretariat building, twenty-eight storeys high (it will be the tallest in the city), and two low circular buildings, the Senate and the Chamber of Deputies, the one covered by a shallow dome and the other having the shape of an inverted dome, which contains a basin-like auditorium. These are linked by two levels of service rooms beneath the platform. They will be the first of the public buildings to be finished, and have already reached the stage where their geometrical form is beginning to emerge from a tangle of concrete formwork and scaffolding.

Around them the complicated series of levels comprising main roads, approach roads, building sites and their surrounding terraces and car-parks have already been established by batteries of earth-moving machinery. The double highway leading into the town passes either side of the platform on which these buildings stand, and then beneath and on to a larger platform at the ends of which are sited the two other major buildings of the central group: the offices of the Supreme Tribunal and of the President and his cabinet, 2. These have already been designed, but not yet started. They are similar but not identical, and are not unlike the President's palace in style, incorporating a marble screen similarly composed of curved members, but in this case set at right-angles to the walls of the building instead of parallel. Niemeyer has also designed a stone monument, 3, to be erected on the same platform to commemorate the inauguration of Brasilia.

The next group of buildings to be started will be several of the eighteen identical government office buildings, arranged in parallel formation, that are sited immediately west of the parliament buildings. These are very simply designed (4 on page 103): 340-ft.-long rectangles ten storeys high raised on *pilotis*, with the interior floor-space (except for lift-enclosures, lavatories and escape-stairs) left open for subdivision as required.

Beyond these government offices, just off the main axis, will be the cathedral, again already designed though no starting-date has been fixed. Niemeyer's design (page 102) is highly original. It is circular in plan with a sunken floor, reached by a ramp leading down-

[continued on page 103

architect : Oscar Niemeyer

structural engineer : Joaquim Cardoso

mechanical engineer : Athânio Barbosa da Silva

interior designer : Ana Maria Niemeyer Attademo

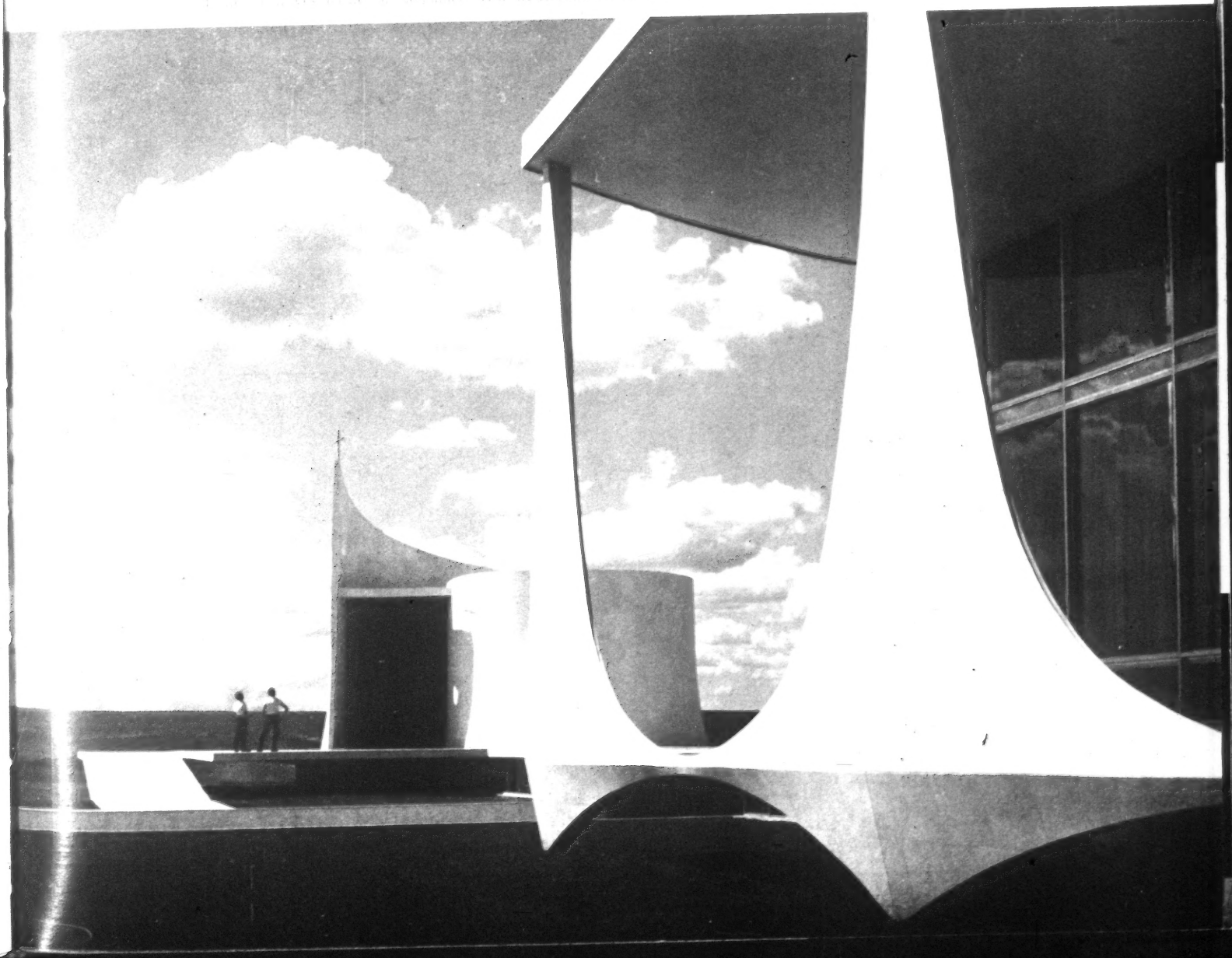
BRASILIA: THE PRESIDENT'S PALACE

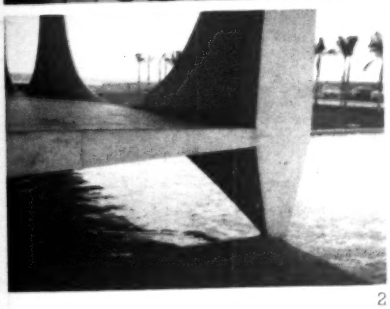
The palace was built in 13 months and completed last June. It is sited on the shore of the future lake (see page 96) about three miles east of the built-up area of the city.

The plan consists of three elements: the main rectangular building of two storeys and basement, flanked by a verandah; a circular chancel on the same level as the verandah, linked to it by a bridge across a main road; and a service wing consisting of basement only at right-angles to the main building and linked to it by an underground passage.

The main building has a central entrance hall rising through two floors. This is on the same level as the paved terrace outside, and from it a ramp rises about 4 ft. to the general ground-floor level of the building, which is the same as that of the surrounding verandah. The main suite of reception rooms (part of which again rises through two storeys) runs nearly the full length of the far (north) side of the building, facing the lake, and terminates in a banqueting-room. The kitchen adjoins this on the south side. Occupying the equivalent position to the banqueting-room at the other end of the building

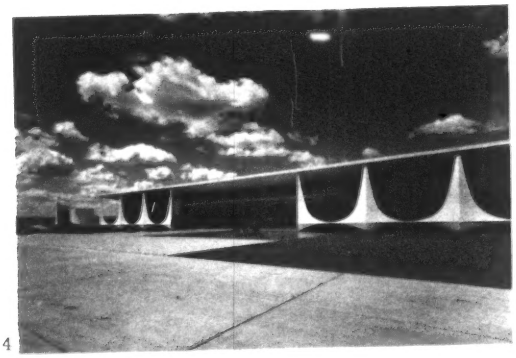
(continued on page 101)





2
3

2. looking outwards from the main entrance hall across the pools and marble-paved terrace.
3. detail of verandah floor and screen where it is broken in the centre of the entrance front.
4. the entrance front.
5. the chapel, with the west end of the palace beyond. A road passes beneath the bridge that joins them.
6. looking from the verandah towards chapel, showing bridge between and the shade cast on the verandah floor by the curved marble screen.



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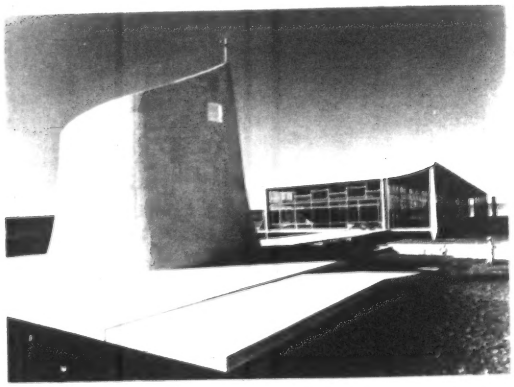
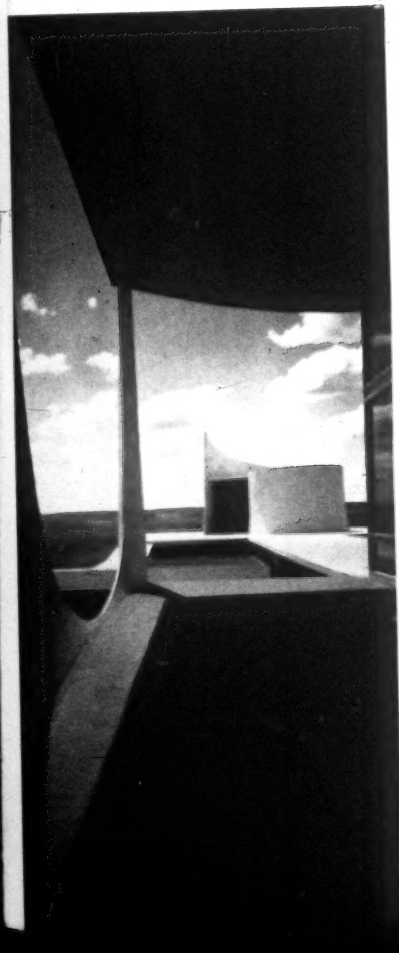


5

BRASILIA: THE PRESIDENT'S PALACE

7 (facing page). the south side of the palace, where the verandah with its curved marble screen extends the whole length. The bedrooms of the private apartments on the first floor have a balcony inside the verandah.
8. part of the entrance front, looking across one of the pools with it's bronze sculpture by Alfredo Ceschiatti.

7 →
8



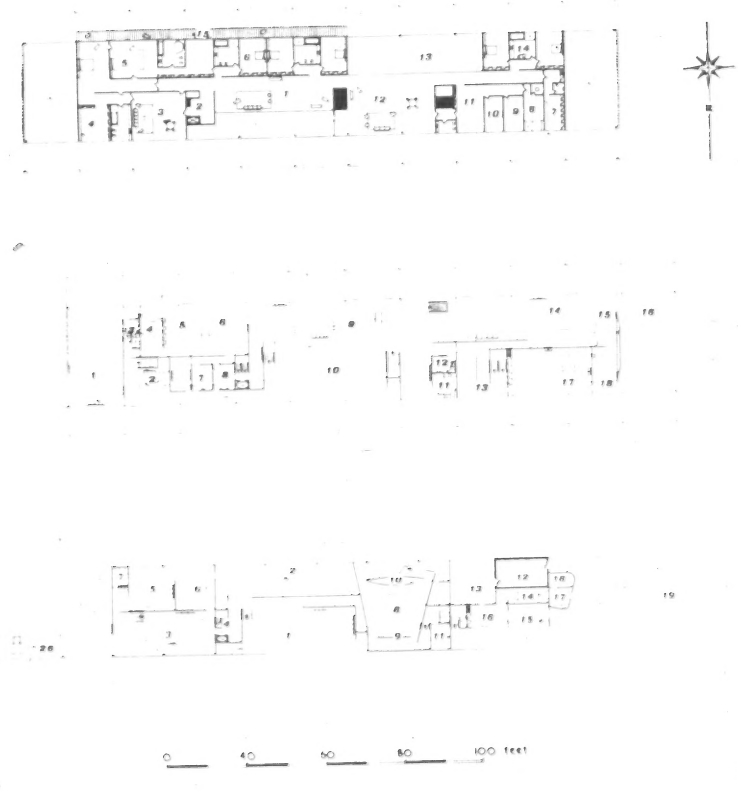
6

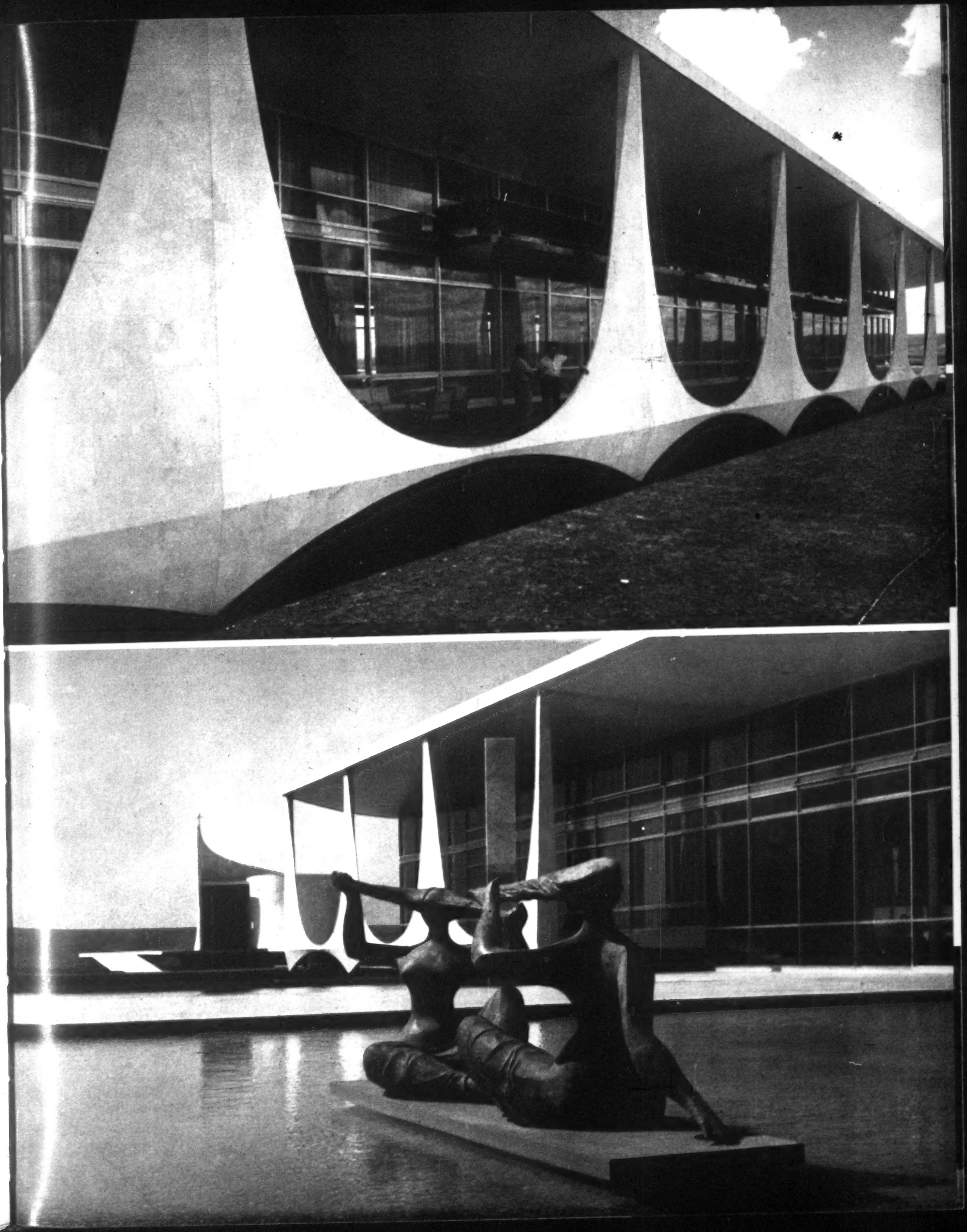
keys

basement
1. entrance hall
2. cloakroom
3. private and Ministers' entrance hall
4. private access to main floor
5. waiting-room
6. guard-room
7. lavatory
8. theatre and cinema
9. stage
10. projection-room
11. store-rooms
12. cold-store
13. food preparation
14. wine-cellar
15. pantry
16. service lobby
17. dirty linen
18. linen-room
19. service corridor
20. staff bedrooms
21. staff kitchen
22. staff dining-room
23. laundry
24. garage
25. service entrance
26. private entrance

ground floor
1. Ministers' conference room
2. waiting-room
3. lavatory
4. Private Secretary's office
5. President's office
6. library
7. office
8. waiting-room
9. main reception hall
10. entrance hall
11. women's lavatories
12. men's lavatories
13. private dining-room
14. music-room
15. bar
16. banqueting-room
17. kitchen
18. pantry
19. chapel

upper floor
1. gallery
2. President's vestibule
3. President's sitting-room
4. President's dressing-room
5. President's bedroom
6. bedroom
7. linen-room
8. Turkish bath
9. powder-room
10. barber
11. service
12. private sitting-room
13. void
14. bathroom
15. balcony



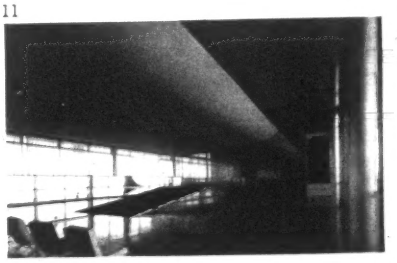


9 (facing page). the ground-level entrance hall with ramp, duplicated in a mirror, leading up to the main level of the ground floor reception suite. The upper part of the picture shows the curved soffit of the gallery connecting the two ends of the upper floor across the two-storey hall.
10. the main reception hall, two storeys high in parts and occupying the full width of the ground floor.

continued from page 97

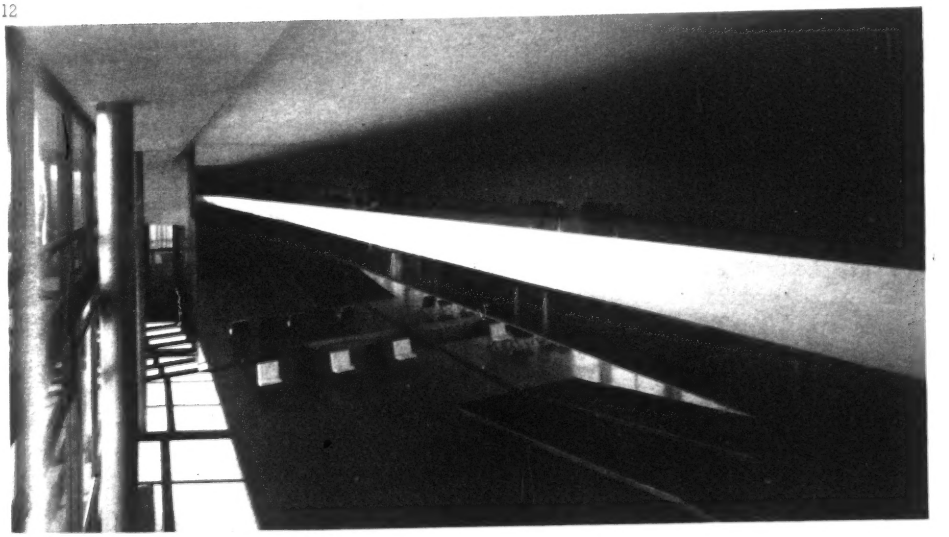
is a Ministers' council-chamber which can be reached by a private entrance at basement level, beneath the bridge leading to the chapel. Also in the basement, which is approached by a road beneath the entrance terrace, are a guardroom, various stores and preparation rooms in connection with the kitchen above, and a private film-theatre. At the end of the service wing, which contains staff living-quarters, is the garage, entered from the far (eastern) side. On the north side of the main building is a swimming-pool. The upper floor of the main building contains the private apartments, divided into two groups which are connected by a gallery overlooking the two-storey hall. The bedrooms of the President's apartments have a balcony facing north, projecting beneath the roof of the verandah.

11



The building has a reinforced concrete frame and roof, the latter cantilevered outwards to form the roof of the verandah, which is also supported by the screen of greyish white marble along the north and south sides. The upright members forming the screen curve outwards at the level of the verandah floor, the outer edge

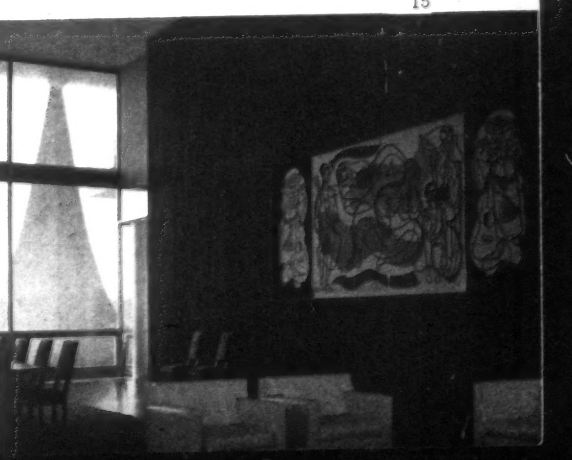
12



13
14

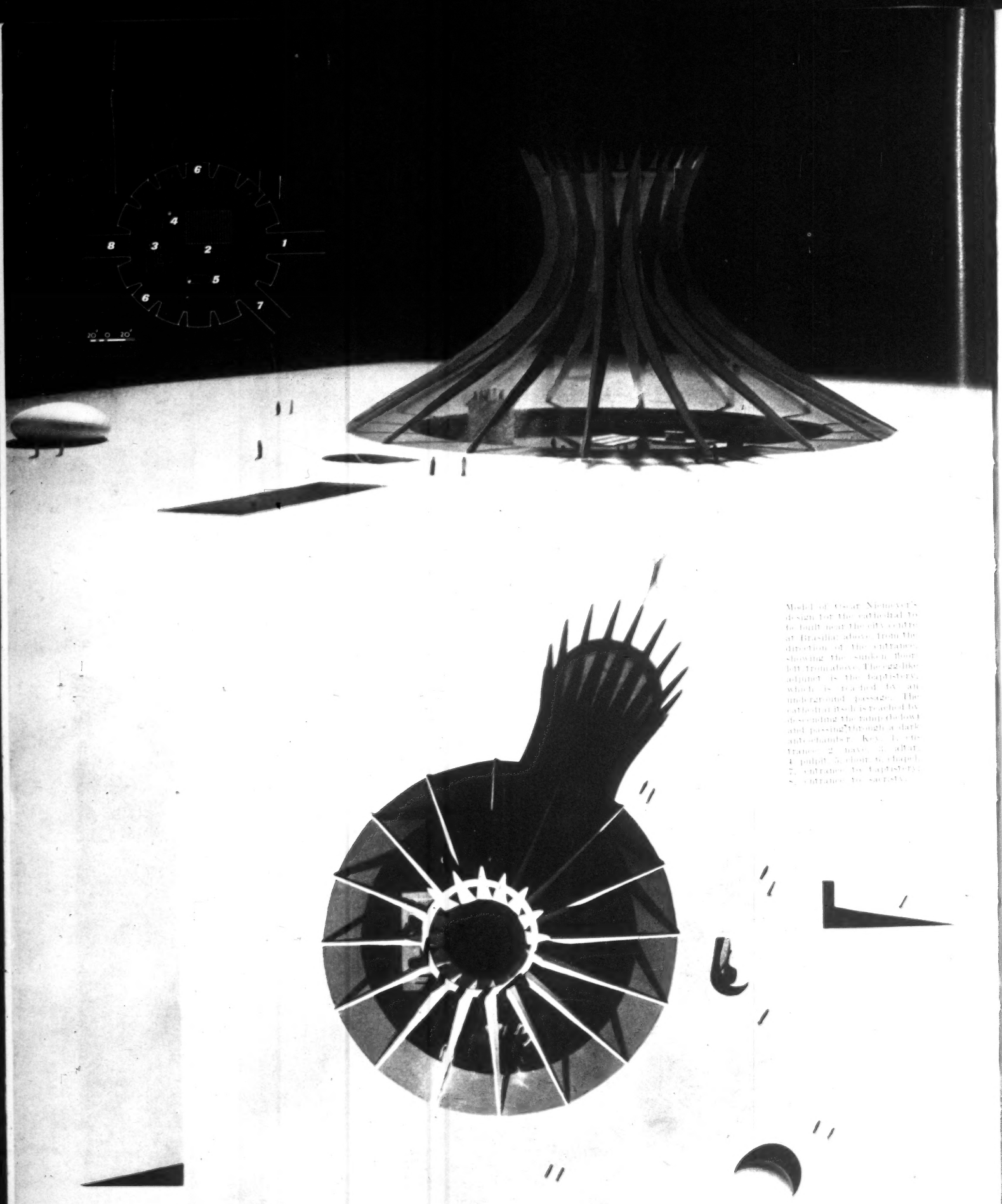
11. entrance hall and ramp (at the top of which the President receives visitors) from the main reception hall.
12. looking down into the entrance hall from the first-floor landing (connecting gallery on right).
13. window detail, main reception hall. The outline of the verandah screen can be seen through the curtains.
14. a tapestry marking the end of the first-floor gallery, by the entrance to the private apartments.
15. a corner in the main reception suite, with painting mounted on background of dark grained wood. The curved verandah screen can be seen through the window.

15



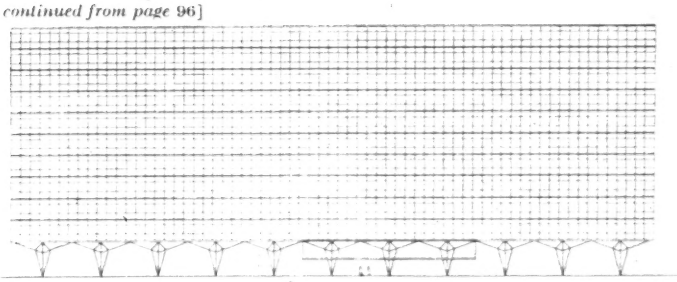
of which they support, and then inwards again to the points at which they rest on the ground. Between the arches thus formed the ground continues underneath the verandah; so do the shallow pools of water on either side of the entrance.

The paved terraces and the walls of the chapel are of the same marble as the verandah screen. The chapel is lined internally with gold mosaic. The walls of the main building are of clear glass except at the western end, facing the chapel, where the glass has a greenish colour to counteract the glare from the low evening sun.



Model of Oscar Niemeyer's design for the cathedral to be built near the civic center at Brasília; above, from the direction of the entrances, showing the sunken floor, lit by triforia above. The egg-like object is the baptistery, which is reached by an underground passage. The cathedral itself is reached by descending the nave and passing through a dark antechamber. Key: 1, entrance; 2, nave; 3, altar; 4, pulpit; 5, choir; 6, chapel; 7, entrance to baptistery; 8, entrance to sacristy.

continued from page 96]



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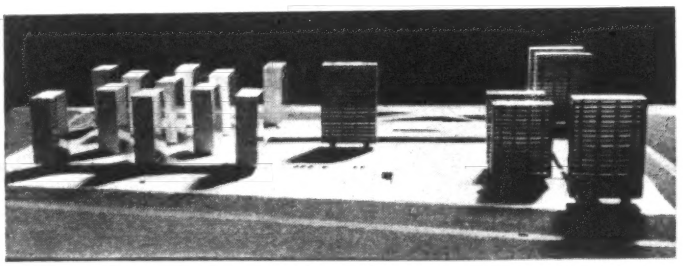


5

Elevation of standard government office building, of which there will be eighteen. Below, layout of business zone.

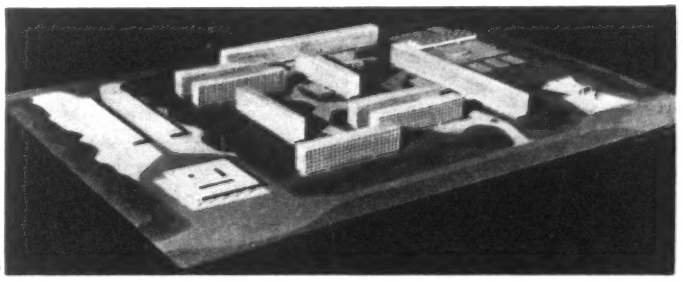
wards from the surrounding pavement. The ramp leads into a darkened ante-chamber, from which the visitor passes into the huge light interior of the cathedral, 230 ft. in diameter and 130 ft. high, holding 4,000 people, shaped like a cooling-tower and, it is understood, functioning like one as well. A detached baptistery, egg-shaped externally, is reached by stairs from a subterranean passage leading from the cathedral floor.

The only other central-area buildings so far designed are for the business zone, where banks, insurance companies and so on will have their offices. A model, 5, has been made showing Lucio Costa's proposals as to how such buildings might be grouped. It is difficult to understand the logic of the change of orientation between the eleven fifteen-storey slab-blocks suggested for private establishments and the remainder, which consist of a twenty-storey block in the centre for the Bank of Brazil and five others, connected to it, for Government financial agencies; but the use of levels to separate motor-traffic and car-parking from pedestrian access (cars approach each building beneath the piazza on which the buildings stand) is interesting and consistent with the planning technique used elsewhere.

The residential zone (see plan) is divided into squares, each housing about 3,000 people, identical in size but laid out internally in different ways. Belts of trees separate them, and primary schools and community buildings are sited among these trees. Another purpose they are intended to serve is to identify the outline of the squares and create a built-up skyline throughout the residential zone, during the period when parts of it have not yet reached the development stage. Work is going forward on eleven of these squares and others will be started soon. The buildings already begun will accommodate 15,000 people, mostly in seven- or eight-storey blocks of flats. Something over 200 flats are on the point of completion, 2,800 are scheduled to be ready by the end of this year and nearly 4,000 by the end of 1960. This rate of progress means that in April 1960, when the seat of Government officially moves from Rio de Janeiro to Brasilia, there will be something like 3,300 flats ready for occupation. It has been estimated that a minimum of 1,800 essential civil servants will have to be working in Brasilia for the Government to begin operating from there, so this leaves a margin of accommodation for others besides civil servants, apart from the smaller quantity of housing that is already beginning to go up in controlled areas outside the main housing belt. Notable among these is a group of middle-class houses already finished, east of the southern arm of this belt, at the edge of the future lake.

The layout of the first square due to be finished within the residential belt is shown in model form in 6, and the progress photograph shows the buildings under construction. In the corner of the model can be seen the neighbourhood church, which is already finished, 8. It is one of Niemeyer's always interesting demonstrations of the use of concrete as a plastic material, though the relationship of some of the planes gives the impression of not having been very fully visualized and the church suffers from having been built, for economy reasons, rather smaller than the architect designed it.

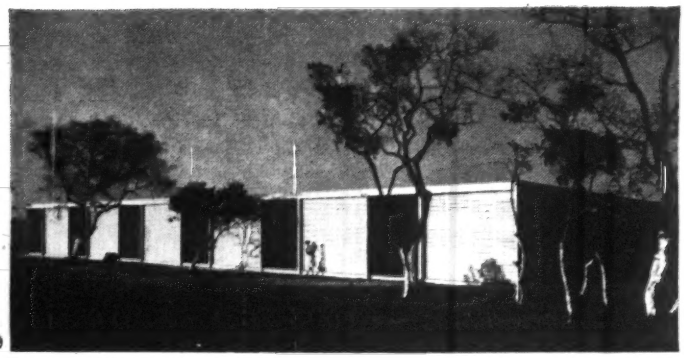
There is now a labour force of about 20,000 in Brasilia, including building and engineering workers, transport and tractor drivers and those engaged in road-making and landscaping. They live for the most part in camps, hidden away in folds of the ground a little distance from the future built-up area (9 on the plan on page 94). There is also, just west of the airport,



6

7

Top, model of typical residential square. Centre, group of squares in residential zone under construction. Right, small church (shown also in right-hand corner of model above) already completed. 8



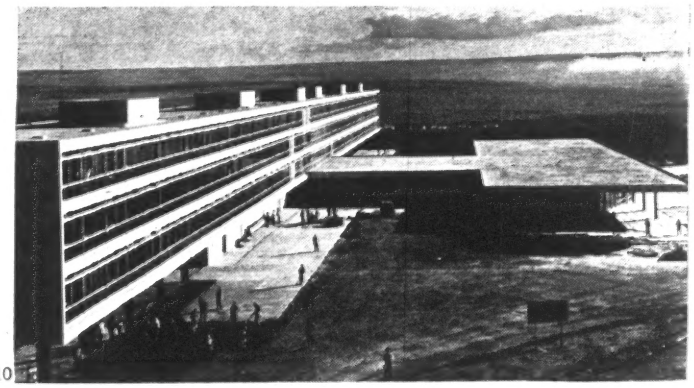
9 *Temporary housing for workers with families.*

which is near the southern tip of the residential belt, a temporary shopping and recreation centre for the working population, known as the 'free town' because any enterprising trader is free to set up there on the understanding that the whole place—which is mostly single-storey and timber-built—will be cleared away in a few years. The total population of Brasilia, including the inhabitants of the free town and others that serve the needs of the construction workers, the administrators, transport workers, police and those who run the services already established there like the airport, the power-station and the hotel, is now about 45,000.

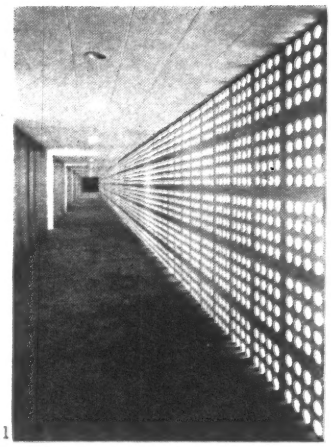
The only industries so far established are small ones connected with the building works, and some of these are probably only temporary. There is also some temporary agriculture, because in order to create a source of food in this hitherto unpopulated region, financial help has been given to farmers to start smallholdings on a short-term basis on land that may eventually be too near the centre of the city to be permanently agricultural—it may be required for parks and playing-fields or outlying housing areas.

There is also a long-term plan for promoting agriculture in the region. Land is to be leased to farmers on initial leases of thirty years. Owing to the poor quality of the soil at present they will be helped to improve its fertility, on the basis of a survey of the potentialities of different areas and the crops most suitable for each, which has already been made. So far forty-three farms have been allotted to tenants by the Ministry of Agriculture, and besides these four large model farms have been planned, which the Ministry will operate itself. The area over which this and similar regional planning is going forward is about 2,000 square miles, and a commission has recently been set up to study the future of the even bigger region of which Brasilia will eventually be the centre.

The programme for building and siting hospitals and schools in and around the city is fairly complete, but construction of these is only just beginning, except for some temporary schools for urgent present needs, of which there are not many because construction workers have been discouraged from bringing their families. Housing and government buildings have the first priority because of the decision to move the seat of Government to Brasilia next year. Great efforts are being made to get the life of the city well under way, and the Government solidly established there, by this date because soon afterwards there will be a presidential election. President Kubitschek (who cannot constitutionally be re-elected) has been the driving force behind the construction of the new capital; the energy that is being put into the project is the result of his enthusiasm for it; its architectural quality derives from his interest and discrimination. No one knows how a change of president may affect its future progress and even influence the official policy towards what is, for Brazil, a long-term investment made at an unusually difficult moment as regards the country's economy, as well as a declaration of faith in the future.



10 *The Palace Hotel, the second building to be completed (2 on plan, page 94) above, looking along the bedroom wing; the public rooms occupy the single-storey wing on the right; right, looking down the 400-ft.-long corridor, with bedrooms on the left and a continuous screen on the right of pierced concrete blocks with holes filled with glass.*



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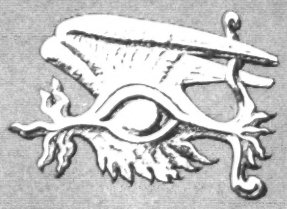


the exploring eye

The patronage of Big Business in search of prestige is as much a part of the history of the Modern Movement as the patronage of Popes and princes is part of the history of the Renaissance. Pioneering designs were produced for the Larkin Company, for AEG, for Fagus, for Voisin—designs without which Modern architecture would have been different—and the recent efflorescence of US architecture depends heavily on business patronage, even when it is disguised by University foundations. The motives of such patronage are rarely disinterested but buildings are not necessarily the worse for their patrons—if you seek proof consider the work of Alberti for the vain, irreligious, immoral, pleasure-seeking tyrant of Rimini.

Herbert Bayer's contribution to ALCOA's Forecast programme was also, like Charles Eames's Solar Toy, concerned with the sun, though with controlling it rather than exploiting it. The kaleidoscreen of coloured aluminium panels seen here set up by the pool at Aspen Meadows, Colorado, is intended to serve both as an adjustable abstract sculpture on an architectural scale and as an equally adjustable screen against wind and sun. The side of the panels seen here makes a pattern of coloured shapes, the reverse is left in natural aluminium, giving a choice of reflecting and light-diffusing surfaces.

Patronage is something the designer may bend to his own ends, and ample demonstration of this truism is afforded by the FORECAST programme of the Aluminium Company of America. Leading US designers of every inclination, from Harley Earl, the Wizard of Detroit, to Isamu Noguchi, apostle of Zen in the arts of design, have been invited to visualize the part that aluminium could play in the future of design—and, by implication, the part that design could play in the future of aluminium.

For the most part, designers have stayed within the frontiers of their known specialities —Herbert Bayer, for instance, produced a piece of abstract-functional architectural sculpture—but what could be expected to happen when the invitation reached a designer for whom frontiers exist only to be crossed? As it happened, Charles Eames at first declined to participate because he felt that there were more urgent things that needed action before ALCOA's Utopia. But, since the aim of FORECAST was to promote ideas, it was soon seen to be possible to promote some of these more urgent ideas, as well as ALCOA (though the patron had doubts).

An idea in question was the conservation of natural resources and the search for alternative sources of energy. To fix the idea of solar power as a coming alternative in the public mind, Charles Eames devised his solar toy. The performance of even the most advanced photoelectric cells is not yet such as to produce very much power, and rather than create a machine that did a little practical work grudgingly, he decided to produce one that would do nothing at all, but with a tremendous flourish that people would remember. The resultant do-nothing machine employs the power from a bank of silicon cells to operate an elaborate powered mobile, much as Hero of Alexandria or some rococco goldsmith might have used water power to operate a singing bird or similar toy—with the proviso that this sun-mill was a toy with a purpose.

sun-mill

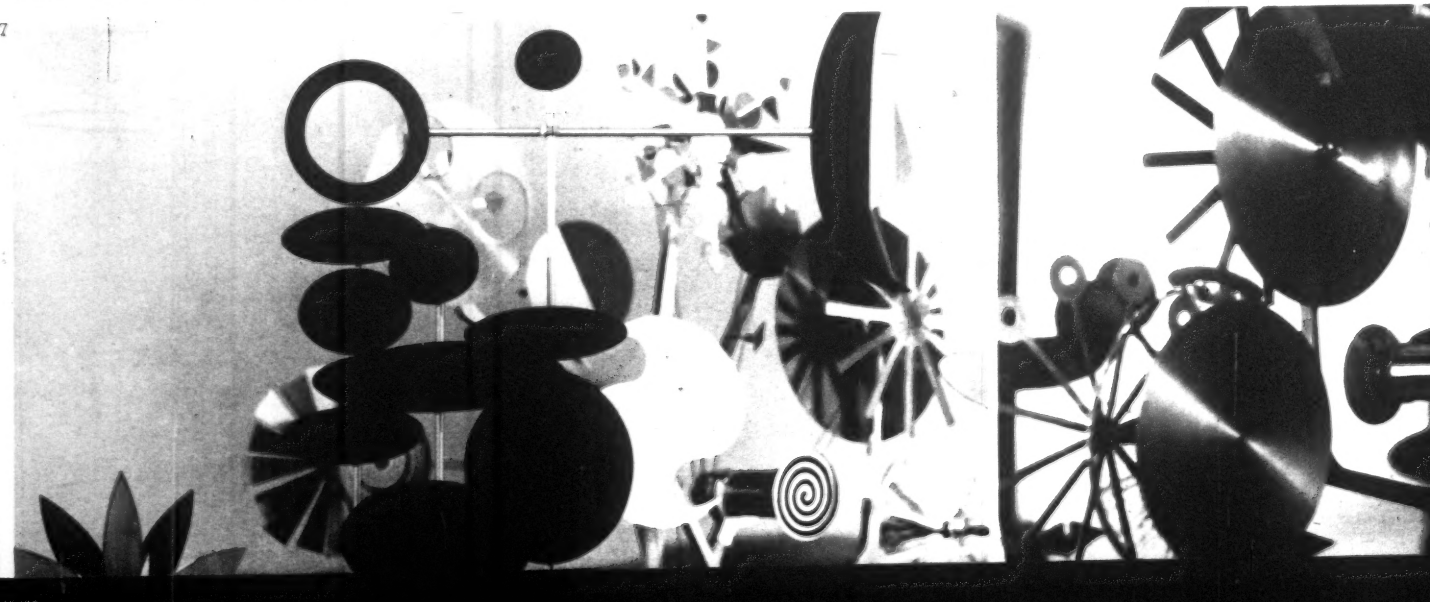
1, 2

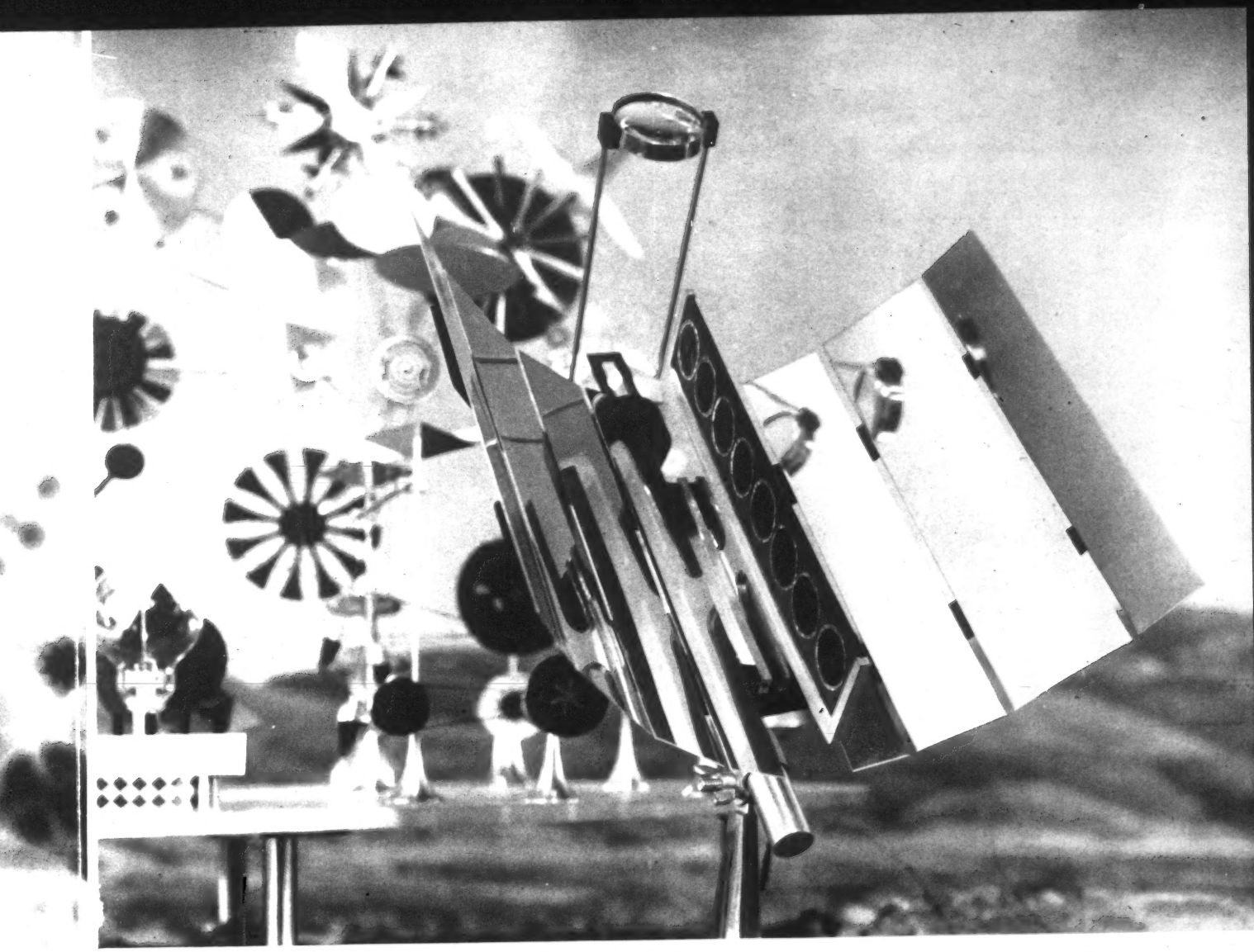
3

1 and **2,** the blur of moving and rotating shapes is the output side of Charles Eames's do-nothing machine, the shallow trough of aluminum reflectors focused on a bank of silicon cells is its input. The cells convert the energy of sunlight into electricity, which is used to power small electric motors (selected by the rank of press buttons visible in both pictures) which activate the various moving displays of the toy. **3,** although the visual scale of the toy is ambiguous in isolation, comparison here with the figure of its creator, shows that it is physically large. This is in keeping with the general programme, that it should perform its elegant nothings with the maximum of effect.

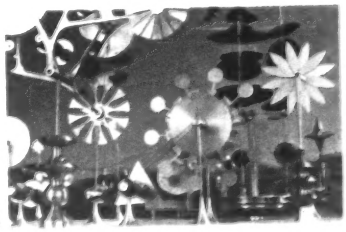
4 and **6,** those who like to generalize about the character of Charles Eames as a designer will surely find plenty of material in the detailing of the toy. On the main platform, for instance, one recognizes in the shapes themselves the hand that designed the *House of Cards,* but what of the structure that supports them? The bases are in a foreground

4, 6, 7





adjoin treat is in line with his well-known interest in ancient pop-art, but the branching upper parts are like some elegant eighteenth-century scientific instrument. And all this is in striking contrast to the purely science-fiction detailing of the light collector itself. Does this contradict the designer's personal declaration that this is not an eclectic conception? It is a nice point in the aesthetics of different functions, but it probably would have been a stylistic eclecticism to impose the same style on both the input and output sides. **5** to **7**, in its parts and its totality, the toy is a work of directed fantasy, and a feat of virtuosity in the exploitation of aluminium as a material of many uses. It is also an addition to the range of mobile sculpture, filling a median position between Calder's early, power-driven constructions, and his later ones, randomly activated by atmospheric movements. Here, natural power is drawn from the object's environment, but its application is not random, which is in character with its function as a didactic device.



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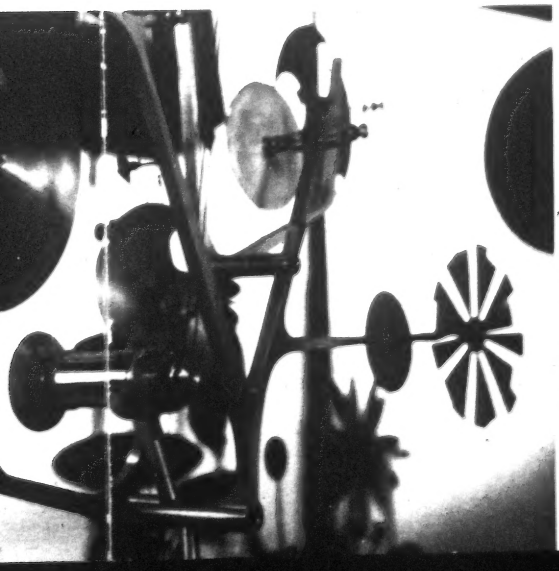
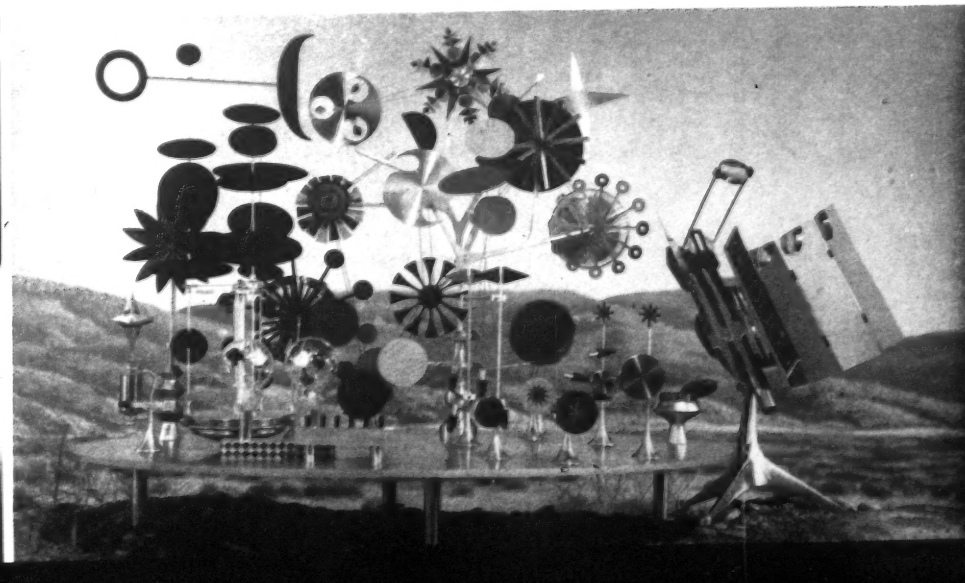




In SPAN developments, architecture and landscaping are not forethought and afterthought. What distinguishes them from other speculati developments is the freedom Eric Lyons enjoys to design the spaces between the buildings at the same time, and in as much detail, a the houses themselves, creating interior landscapes, like these at the Priory, Blackheath, in scale with the buildings that frame them

R. Furneaux Jordan

SPAN

THE SPEC BUILDER AS PATRON OF MODERN ARCHITECTURE

Most of us have lived mainly in an era throughout which domestic architecture has been firmly divided into two; on the one hand the vast spawning over England of the spec' house, on the other hand the relatively tiny group of houses designed by architects. Each of these two groups—the first popular, successful, philistine, the second either bad or esoteric—has each gone its own way, each in utter contempt of the other. It has been Eric Lyons's job to bridge the gap. Twenty years ago he would have been regarded as barely respectable, today he is important. He may even come to be looked back upon as a key figure, less because of his architecture—good as this often is—but more because he has blown the gaff, the gaff that spec' building was unclean, untouchable, and didn't need an architect.

The objection of architects to spec' building has normally been at least as much a snobbish and 'trade union' objection as an aesthetic one, an attitude of hurt dignity that they could so easily be dispensed with . . . just as if that were not their own fault. A determination by architects to prove that they were essential to the great big world of house building has been conspicuous by its absence. It has been easier to say the grapes were sour. As Eric Lyons himself has said: 'Although architects are united at least in their resentment of the despoliation of town and country, it seems very few architects are prepared to interest themselves seriously in the developer's problems.'[1] Eric Lyons has

[1] *RIBA Journal*, May 1958, p. 223.

not been merely employed and tolerated by a spec' builder; he has initiated, experimented and controlled. He has been a vital cog in a successful machine. He has made himself as necessary to his particular kind of client in the domestic field as, say, some kind of T. P. Bennett or other has always been necessary in the commercial field. Lyons, however, is also a bit of an artist. He does in fact combine—a rare but not unknown combination—the sensitivity of the artist with a sharp business sense . . . both being necessary.

To make himself an essential cog in the machine of spec' housing was something that the architect of the 'twenties and 'thirties either would not or could not do—would not for reasons of professional dignity, could not for reasons of technical inability. The Garden City was never a commercial spec' in the ordinary sense, while the little AA-Laing competition of 1933 led to the building of half a dozen houses but was a commercial failure. At that time—the spec' builder's heyday—the architect's only real retort was to advocate both planning control and aesthetic control; he got both in the end, and if ever the biter was bit . . .

With Eric Lyons's housing schemes we return to something like the proper role of the architect in spec' building, the eighteenth-century role. Historically, of course, speculative *building* as distinct from the speculative *builder*, has always been the normal method of making towns. The palaces and churches of the architectural history books are all abnormal, beautiful freaks that have survived. Ordinary men, once they had evolved beyond building hovels with their own hands, have seldom lived in 'tailor-made' houses; houses have always been sold to them over the counter. There is nothing wrong with that and historically the role of the architect in it all is hardly worth discussion, so much is it a matter of mere nomenclature. So hazy has always been the border line between the country builder who could draw out a façade and the architect who paid his own workmen, that as often as not they were the same man.

The roles of Eric Lyons and of G. P. Townsend, his former partner, present client and spec' builder, are rather more clearly defined, but not much; the difference in social status is nil. That point has probably never occurred to them, nor would it have done a hundred years ago when hardly any architects were gentlemen. Fifty years ago—when architecture significantly was at rock bottom—it would have been vital. In those days if an architect must soil his hands with 'real building' then it could only be in an arty-crafty and romantic manner—as with Gimson's Leicestershire cottages. Voysey's efforts to be a 'real builder' via the drawing-board, in the revival of an architecture that had never known the drawing-board, were merely pathetic. In the middle ages the border line did not exist. In the eighteenth century it was blurred; although the word 'architect' was by then a common one, Bath and the spa towns were all speculative schemes involving an architect only because the test of the potential customers demanded it—someone, such as the Woods, had to handle the current clichés.

The first snobbish, as distinct from aesthetic, objection by an architect to spec' building was Sir John Soane's protest against the Dowager Duchess's speculation in Bedford Square; the employment of Leverton did not alter the fact—a sad one to Soane's mind—that the houses were built to sell to, rather than directly for, the residents. The Square is today an historic monument, but only as a speculation could it have been given artistic unity under one hand. Nash, while also able to give to the Terraces a similar unity, was really the common denominator between 'the age of taste,' which was on the way out, and the jerry builder who, thereafter, was to dominate the scene for over a century, dragging in the mud the very name of spec' building—a fate which in itself it did not deserve.

Clearly, therefore, in this century the only thing that could restore the position and put the architect back into spec' building, *as a key figure*, was a renewed demand for technical integrity accompanied by a change of taste. If once again—but of course in a wildly different context—there was to be a demand, as in the eighteenth century, for careful planning to match specific ways of living, for carefully considered form and colour, for a designed landscape, for a structure at least comparable with radio sets and cookers (as eighteenth-century building was comparable with Chippendale) and for economic realism, then once again the architect would come to be not merely tolerated but would be found essential . . . always assuming that he knew his job. Such a revolution, involving all this, is not yet universal, but has indubitably begun in odd corners. It necessitates the architect. Professional publicity and legislation have done little to bring this about; they are the product rather than the cause. Bigger causes—the usual forces of social history—have been at work. In the last decade these forces have made a chink in the grim wall of popular taste, and through this chink Eric Lyons has been the first to stick his nose.

This change in taste is obvious and need not here be dilated upon. It is all round us. The welfare State, the environment of the modern school, the example of the best public housing, the BBC, women's magazines, COID, technical education and popular science, new

ways of living, travel, Espresso bars, Penguins, Festival of Britain, etc., have all played their part. Such popular taste is of course very easily debased, commercialized, exploited and, indeed, created for base motives. It is then called 'contemporary.' There is nothing new about all that; commercial exploitation of U level taste at non-U levels has gone on throughout history. Today with all our channels of communication and distribution, it goes on more quickly; with the absence of a vernacular and with our literate masses, it is spread more widely. Such cashing-in always begins with the things most easily produced. You don't 'tool-up' on the strength of a fashion. First come clothes, then textiles, typography, furniture, then decor, then 'tailor-made' architecture. Then cars. Last of all, spec' building. For, last of all—terrified of deciding and unequipped to decide between a cultural revolution and a fashion—are the building societies. They call the tune and so settle the timetable. As Mr. F. Lee, of the Building Societies Association, has said, it took precisely ten years for the Societies to accept maisonettes.[2] That, more than philistinism itself, has been the real brake. Not mass addiction to mock Tudor—that is almost out anyway—but huge vested interests in mock Tudor, and in the road layouts that go with it, have been the real barrier to the Eric Lyons and Span Buildings liaison. The sale of the Span[3] properties—and they sell before they are built—has not been considered by the Societies as proof that they are sound investments. That barrier, however, as private owners resell at very substantial profits, is now just beginning to crumble . . . four years after the Ham scheme has proved itself.

Dialectically therefore the 'chink' which gave Eric Lyons his chance was bound to happen, and so at some point there was bound to be a Lyons. Not that the social forces mentioned were the only ones, or even the main ones. As always the final 'push-over' was economic. 'I think we are approaching the time when it may no longer be economically possible for the individual to have built his own "special" house, and, from a town-planning point of view, I doubt whether there is any solution to the collection of individually designed small houses—no matter how well designed. I want to emphasize the word "small." It is due to the advent of the small house that the new town-planning problem has arisen.'[4]

The high cost of the 'tailor-made' house, plus land costs, plus the inability or refusal of the individual to solve his problem in a non-individual manner, i.e. in an eighteenth century manner—are the main economic factors, but not the only ones, in the story. It is also significant that Span advertising[5] is almost limited to *The Observer* and *The Sunday Times*, papers read almost wholly by a highly literate and almost eccentric class who would, at least until about 1950, have never contemplated a spec' house save in horror—least of all as a home for themselves. The fact is that while the change in taste has moved up the social scale to embrace the readers of 'posh' newspapers, the value of money has also brought the spec' house buyer down the economic scale. The two things roughly overlap at professional and managerial levels.

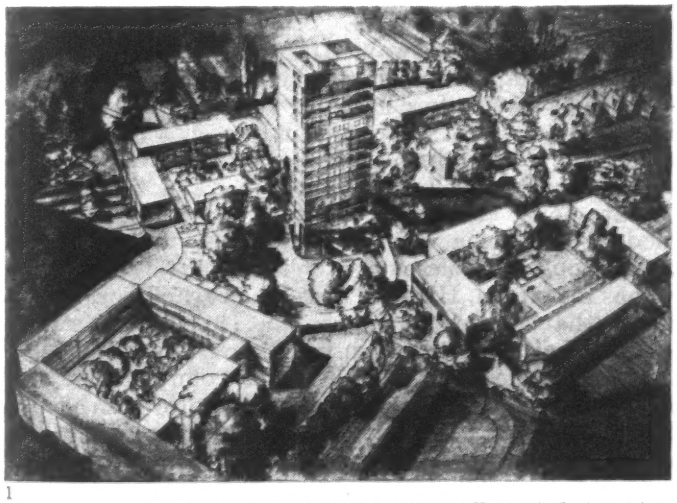
Compared with what is usually meant by spec' housing this means that the area within which the Span idea can operate is relatively small, though widening. The spec' builders' normal demesne—i.e. by-pass land—is ruled out by taste and, presumably, snobbery; inner suburbs such as Chelsea, Bayswater, etc., though formerly normal for managerial classes and well in the running on snob grounds, are now

[2] *RIBA Journal*, May, 1958, page 230.

[3] The name of the development company directed by Townsend.

[4] *RIBA Journal*, May, 1958, page 223.

[5] After inspection of the work itself one finds that the usual advertiser's encomiums do—for perhaps the first time in one's experience—bear a ring of truth. One also notices that 'Large Mortgages Available' can now be added.



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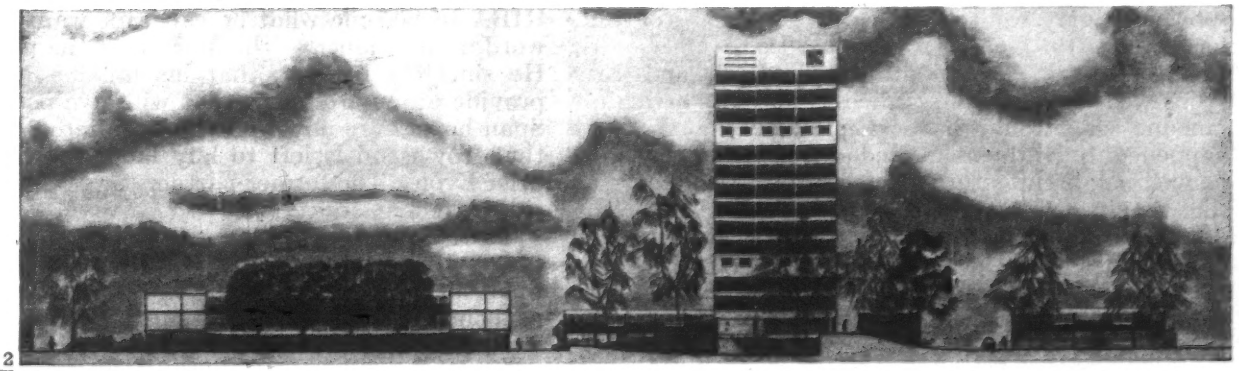
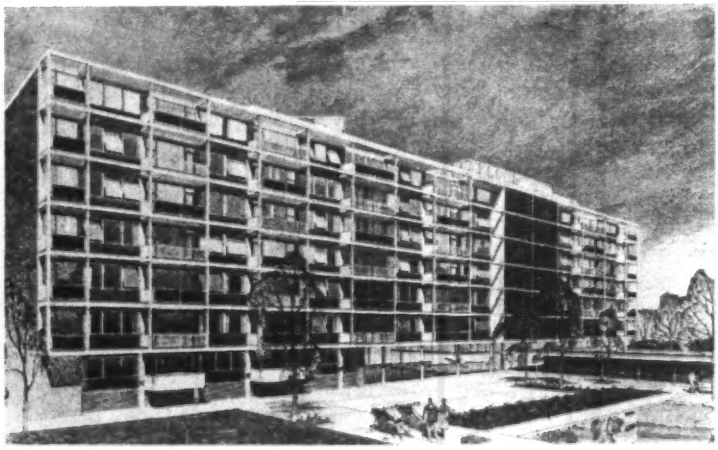


2

1 and 2, aerial view and elevation of the scheme at Hills Road, Cambridge, the first to include a tall block set among two-storey housing.

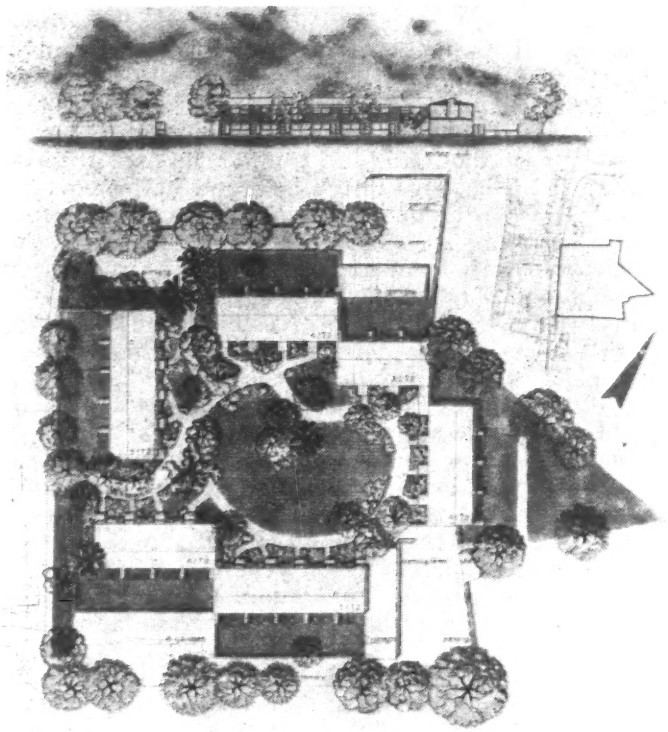
becoming ruled out by property values, the devaluation of snobbery as such, the cost of decent conversion and the resulting absence of amenities. This, at present, has caused Lyons and Span to operate in the left-over areas of the more salubrious outer suburbs—Richmond, Twickenham, Teddington, Ham, Blackheath and Beckenham—where commuting has its compensations in sylvan surroundings. Hence the frantic battles that Lyons has had to wage with local amenity (i.e. preservation) societies and with town-planning authorities who ought to know better—battles with those who can recognize any sash-windowed brick box as 'Georgian' but who still, even today, cannot see the true Georgian essence of a group of houses combined into a single architectural unity and related to a designed landscape. Those battles are still having to be fought, but it may be significant that Cambridge has accepted fairly easily the kind of housing for which Richmond is already famous but which it tried furiously to reject.

In addition to this kind of leafy suburb there may also be possibilities in certain 'unusual' provincial cities; there is a scheme at Hove, 3, and the Cambridge scheme, 1 and 2, with its mixed high and low building, has already begun. By and large, however, the geographical area within which the particular social and economic forces are at work is a small one, though the success of the schemes is enlarging that potential area all the time.



3, perspective of the block of flats at Hove.

It is unlikely that an entirely new genre has been created, or that Lyons's houses are architecturally epoch making. They meet the requirements of an epoch, which is not quite the same thing. In time the whole idea may well prove to have its place only in the decade 1955–65 . . . to be then superseded. Nevertheless, a certain situation existed and Eric Lyons was the man who cashed in on it. If he hadn't someone else would have done. Not that he just 'happened' to be the man. He had social and economic as well as architectural perception. Also courage. Like Pimlico's Cubitt, or Nash, or Ralph Allen, seeing a situation he both exploited it to his own advantage and solved it to the general advantage. As with those earlier men the client's 'taste' was a given factor of the first importance, not an irrelevancy to be wooed by the architect.



4, project at Coventry, where building has not yet started.

Eric Lyons—born 1912—was an articled pupil while studying at Regent Street Poly evening school. He worked for eighteen months with Gropius and Fry during the Impington period. As much or as little may be read into these facts as one wishes. He went into partnership with G. P. Townsend who had trained in the same way. After the war Lyons performed the apparent miracle of building a private block of 24 flats before licensing stopped him. This, at Richmond, is still a presentable piece of modernism under the Fry influence. He is a typographer, has designed a best-selling Tecta chair, and builds one private house each year. He lives in a new and very modern wing of a very exuberant and turreted Victorian house at Molesey. In the main part of the house he has his offices. His staff are a good team working in rooms that look on to the garden. The administrative machinery is efficient because it is almost non-existent. At Molesey he lives in 'the Lyons country' and has never been trapped by London's idiotic overheads. He is really a new phenomenon, neither provincial nor metropolitan—a successful suburban architect.

G. P. Townsend—born 1911—resigned from the RIBA to become what he calls, for want of a better word, a 'developer'—'the Martha of the partnership.' He sincerely believes that his mission in life is to provide an environment that will give people a 'lift.' Span houses are now built by negotiated contract, so that Townsend is left to buy land, to sell leases, to brief Lyons. The former partners are, therefore, quite simply, client and architect.

Their own statements on their job were published nearly three years ago. In view of the success of the Span idea since then, those statements are now seen as being something more than theoretical, and are

[continued on page 119

Flats at Teddington

Situated on the Lebanon Park estate in Teddington, on the outer western suburbs of London, these flats are among the earliest of the Borough's many schemes which have been carried out under the SPAN development system. The accommodation comprises 24 terrace houses and 48 flats which have been completed in two contracts.

The houses are of two storeys and the flats of three storeys with access balconies at the rear. The external walls are of brick with tile hanging at first floor level and the roofs are covered with concrete interlocking tiles.

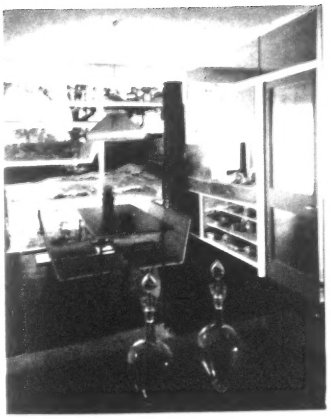
The houses are heated by gas-fired warm air systems and the flats by gas-fired central heating systems with radiators in the living rooms and bedrooms.

Site plan showing complex

The kitchens are fitted with a full range of units and have a stainless steel sink unit, a gas cooker and a refrigerator. The bathrooms are fitted with a bath, a wash basin and a water closet.

The houses have a floor area of 1,000 sq. ft. and the flats have floor areas of 750 sq. ft. for the two-bedroom units and 600 sq. ft. for the one-bedroom units.

The contract was carried out by Messrs. Wates Limited, of Purley, Surrey, to the designs of the Borough Architect and Planning Officer, Mr. Ernest Hall, F.R.I.B.A., A.M.T.P.I., and the Deputy Borough Architect, Mr. Ronald Ward, A.R.I.B.A.



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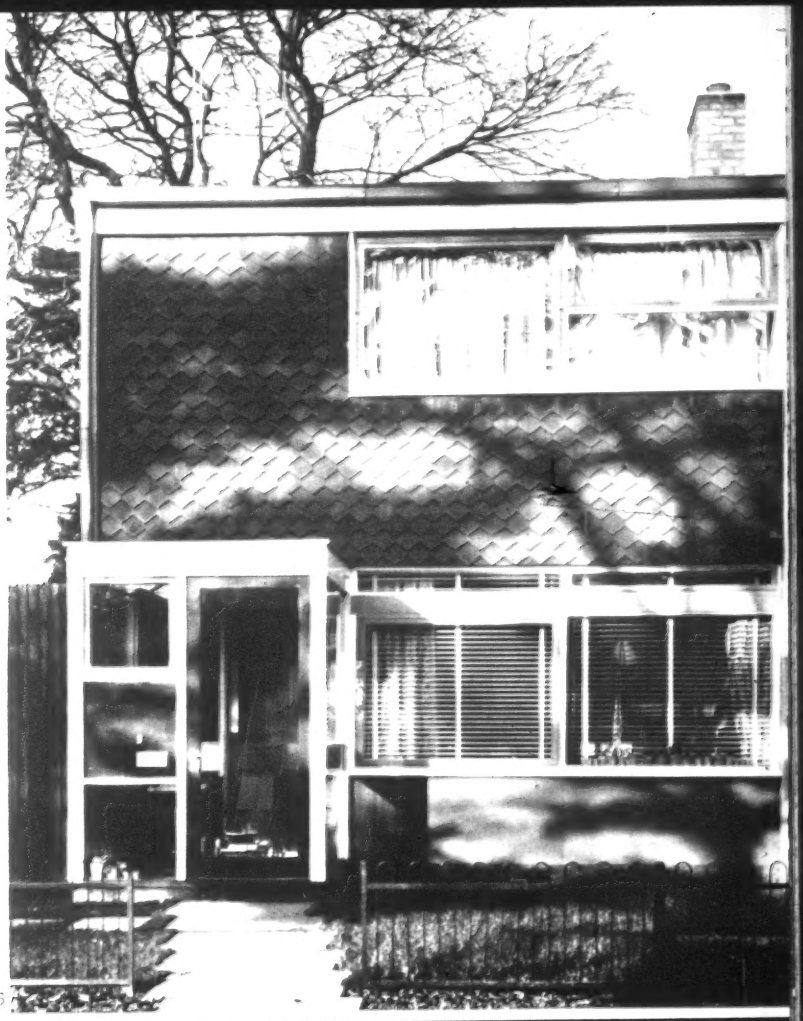

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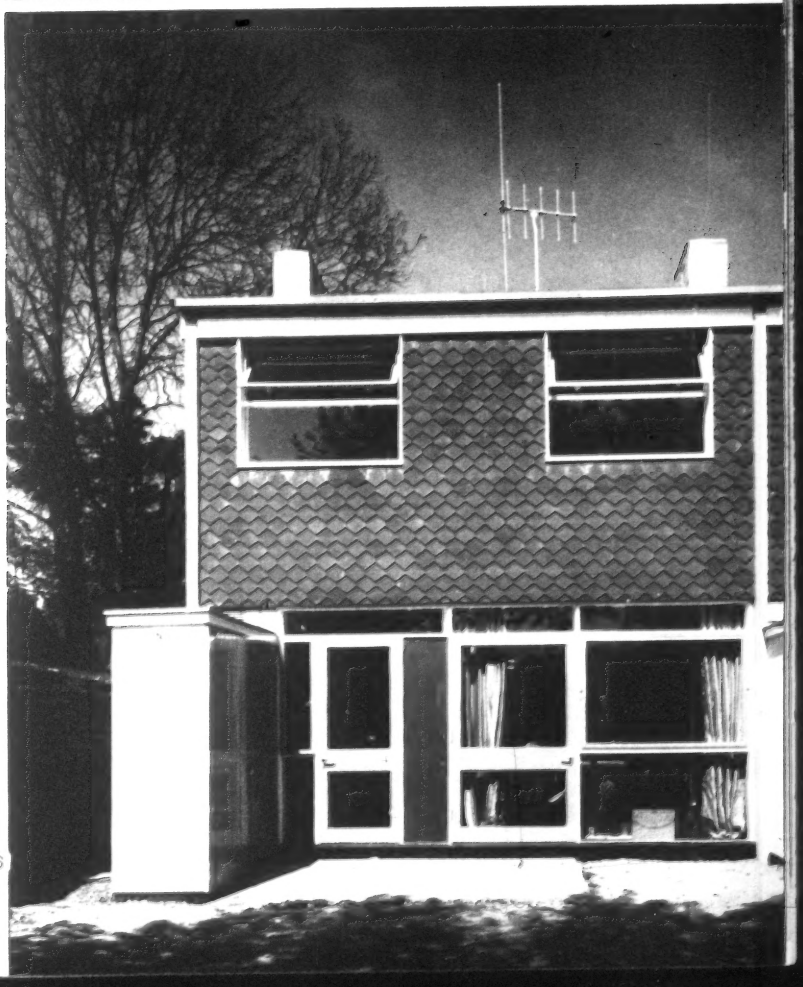


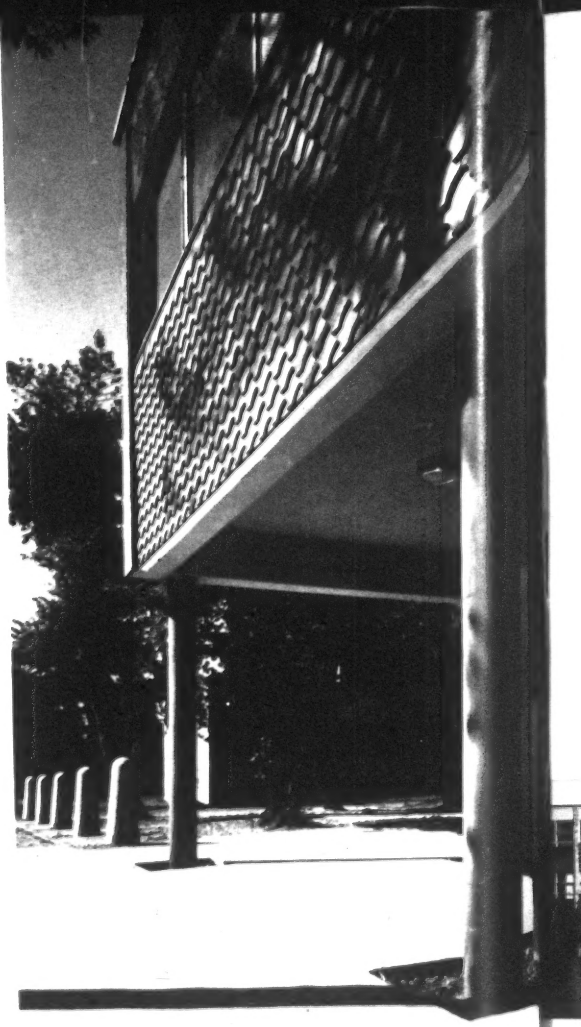
6

The Priory, Blackheath

7, *the Priory, one of the group of related schemes in Blackheath, a south-eastern suburb of London with considerable landscape qualities, lies largely in old gardens belonging to the ruined Priory that gave the scheme its name, and has been retained as a 'folly', lying just beyond the farthest range of buildings visible in this view.*

site plan showing viewpoints

8, 9 *and* 10 *(facing page), essential to the planning of the eastern half of the Priory site is the underpass connecting the two main garden-courts on that side, a social amenity as well as a circulation link, providing covered public space at a point where the inhabitants naturally meet.*



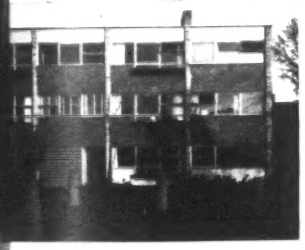
8

9

11. *in spite of the Priory's comfortably high density of fifty persons to the acre overall, and the inevitable economic pressures on speculative development, it is still good business and good design to be generous with areas that are not directly saleable to clients, as in this open stair-hall adjoining the covered underpass.*

12 *and* 13. *the bulk of the flats in the Priory, including the three-storey blocks whose use is encouraged by the falls of the site, are of the revealed cross-wall construction that is almost a SPAN house-style, but the framed structure of the underpass block is expressed by developing the facades on both sides in long horizontal bands of tile-hanging and fenestration.*

10



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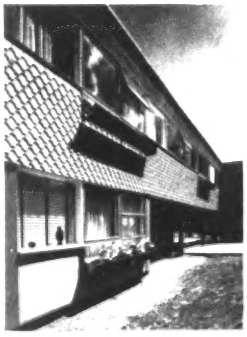
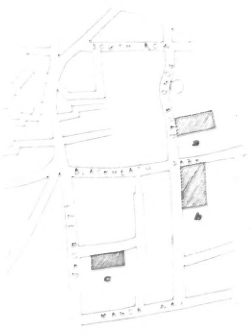


13

key site plan
a. the keep: not illustrated
b. the hall
c. the priory



11

The Hall, Blackheath

14, the Hall, lying on the gentle slope below Blackheath Park, a broad avenue of picturesque early-Victorian houses, is a mixed development of flats and houses, lying right and left, respectively, of the road in this view.

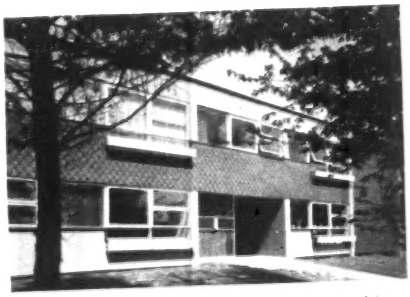
14

17

18 and 19, separated from the rest of the development by Fayes Dale, are a group of three-storey houses, including this show-house which was widely noticed by the press and the home magazines, thus providing one of the SPAN developers vital links with their possible public. The weather-boarded treatment of the elevations is being used for further three-storey housing at this end of the site.

13

15

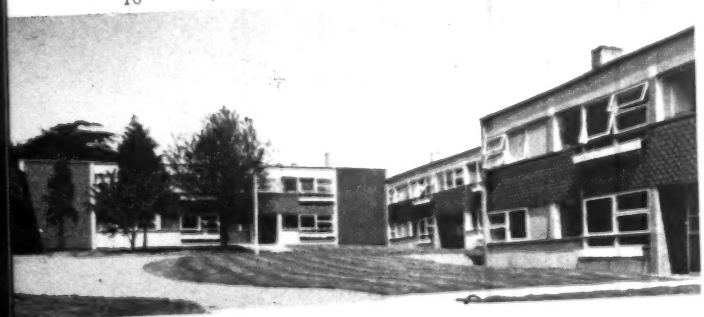


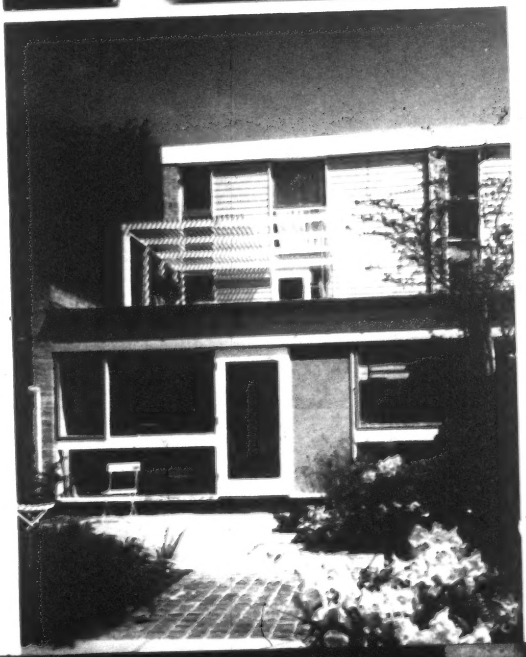
site plan showing viewpoints

15 and 16, one group of flat-blocks (that nearest the camera in 1) forms an almost completely closed loop framing an inner court whose landscaping makes sweeping use of the fall of the site.

17, toward the southern corner of the site, the flats are grouped in loosely staggered ranks, and their living rooms face outwards, leaving the court behind them for vehicle access.

16





19

20

20 and 21, most of the area between Foxes Dale and Blackheath Park is occupied by two-storey houses of the T2 terrace type, with pitched, split-ridge roofs. Although the ground rises, the houses are not stepped within the terraces (rarely a happy effect) and changes of datum are marked strongly by staggering the blocks or even inserting screen walls, as here, which also serve to tidy up access to back gardens.

22, within the site, successions of blocks at right angles provide stopped views that keep the eye within bounds, establishing a domestic scale which is recaptured by the developers' planting and the choice of path widths.

21

22

Parkleys, Ham Common

23 Parkleys at Ham Common, as we say in the west of London as Blackheath is to the south-east, is a genuinely flat site, and consequently the characteristic SPAN treatment of small grassed surfaces, street furniture and paving is unique, both indoors and out. Compared to the earliest 100 plots, some of the later houses in three-storey blocks at Hyphen Square are very different in detail.

25 Already at Parkleys the character of the scale of the later SPAN developments had been established, a partially closed courtyard [illegible] trees and [illegible] pattern used to give an area of [illegible] related [illegible] to the modules of the carpenters' sheets of the facades.

site plan showing viewpoints

23

25

26

continued from page 112]

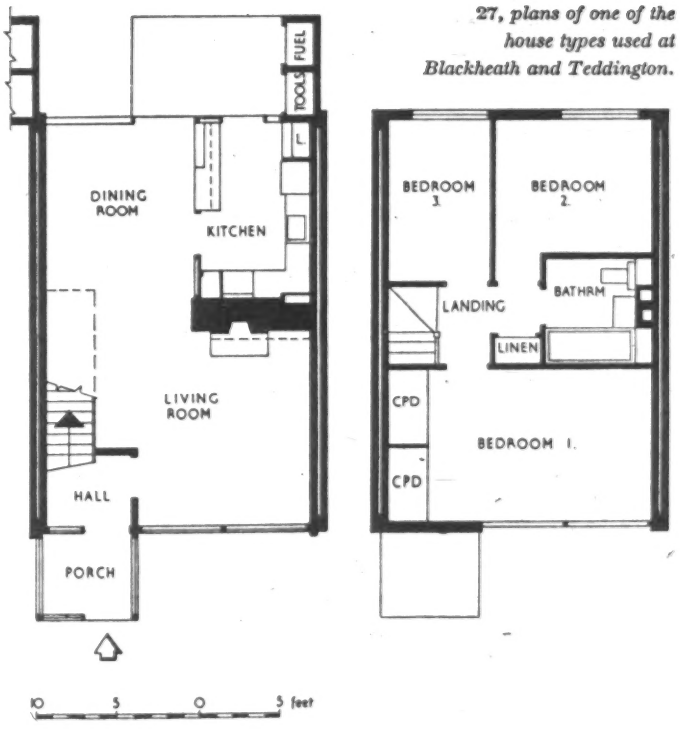
still worth quoting.[6] Eric Lyons then said: 'I believe that architects are suffering from an excess of "professionalism" which is lowering our status and frustrating creative development. We are generally despised by most creative artists and are barely tolerated by engineers, surveyors and other technicians. I cannot support the theory that the architect should become a super-technician who co-ordinates a team of technicians, as I believe that *the real criterion of the architect's activities must be an artistic one*. Like other artists, architects, of course, must be technically equipped, but, as in other arts, an obsession with technique is evidence of artistic sterility. Our scope is reduced by an ever-increasing number of "specialists," town-planners, interior decorators and so on. The theory that this is giving the architect greater freedom is not supported by very much evidence and I think it is about time we reclaimed our proper interest in town-planning, landscaping and all spheres of creative design.'

G. P. Townsend's statement, made at the same time, is perhaps even more significant: 'Contemporary design has been the basis of our approach to the problems of providing accommodation that will give a pleasant and stimulating background for day-to-day living. The results have more than justified our belief that the public would appreciate a contemporary environment and I am satisfied that architect-designed houses and flats can be produced to sell at competitive prices, and to show the developer the necessary margin of profit. . . . *The architect has to design and organize so that buildings can be produced at the same cost as a builder's scheme providing the same accommodation.* This means that the architect must collaborate at all stages with the developer in considering siting, construction, methods, materials and the administration of the contract. Some architectural ideas have to be scrapped . . . other progressive ideas are incorporated even though at the time the public response may be a matter of conjecture. So far the public response has been highly favourable . . . the appreciation of the buying public is far in advance of the ideas of most local authority officials and local planning committees.'

The two sentences that I have italicized above, by Lyons and Townsend respectively—apparently antithetical—would seem to sum up the problem. They also symbolize an age-long conflict in architecture. It is in resolving the antithesis that the Lyons-Townsend system has succeeded.

Those schemes have nearly all been illustrated and described from time to time and need not, therefore, be analysed again here. The essence of them all, however, is something almost universally absent from normal spec' building and almost always present in good eighteenth-century building—*landscape*. This does not just mean that Lyons can plan a pretty garden and has somehow persuaded Span to pay for it. The whole approach is through landscape. The landscape, the design of houses within an environment, is the starting point of the design from Lyons's point of view; the top selling point (see advertisements) from Townsend's.

[6] *Architects' Journal*, 20, 1, 55, page 72.



27, plans of one of the house types used at Blackheath and Teddington.

In the majority of the schemes,—almost all of them apart from the projected high building in Cambridge —low terrace blocks of houses or flats, mainly two or three storeys, surround and fully enclose communal gardens. A garden surrounded by domestic building *can* be too large. In the Lyons schemes, however, two or three garden courts may be formed, rather than one big one, with the paved link between them sometimes carried under the buildings. This gives a vista from one garden to another. It assures—and here again an eighteenth-century comparison might be made—that the gardens are not too large, that there is a correct proportional relationship of horizontal space to building height, and a proper sense of enclosure. That proportional relationship is rare today when building heights are controversially argued without reference to foreground. The height-space relationship in most Georgian squares is correct, also in most but not all (not Downing for instance) Oxford and Cambridge colleges. In the so-called 'closes' of the garden cities the space relatively to the cottage heights is usually far too big and—owing to the administrative machine having got out of hand —is ridiculously so in the New Towns. *The landscape design in the Lyons schemes is beautifully in scale with the buildings.* The architect has had the courage to recognize how small his buildings are and so to cut up his site almost, sometimes, to the point of being pretty-pretty. There is a further analogy here in the gardens of old cottages. Traffic, service entrances and garages are usually on the perimeter of the scheme, so that the gardens remain an undisturbed precinct. They also form the outlook from the living-rooms. One valid criticism arising from the planning around small garden courts concerns the very real risk of one flat overlooking another. This criticism is now recognized and in the later schemes especially there is a good

deal of ingenious 'dodging' of windows to overcome the difficulty. While the detailed planning is impeccable, the visual penetration of the living-room by the garden is also a governing factor in the whole scheme. But it is the correct scale and good proportions that are fundamental. Is this the first time that garden design has been well and truly related to the extremely small superficial area of the post-war spec' house?

The main point, however, is not merely that Lyons is one of a small number of architects who have persuaded their clients to spend a little on planting because planting is nice. True, from Lyons's point of view the whole theory of planning terrace housing and flats around courts collapses without the landscape work, since the architect's potentiality is thereby wasted. Equally, however—and for that same reason—the scheme collapses from Townsend's point of view. Within the whole social picture the planting, equally with, say, the kitchen cabinets, is a major sales point. We have, in fact, if on a different scale and in a different context, returned to the point where the residents of the spec' built Circus at Bath paid for town-planning and the lawn and the trees as well as for the drawing-room, as their side of a commercial proposition.

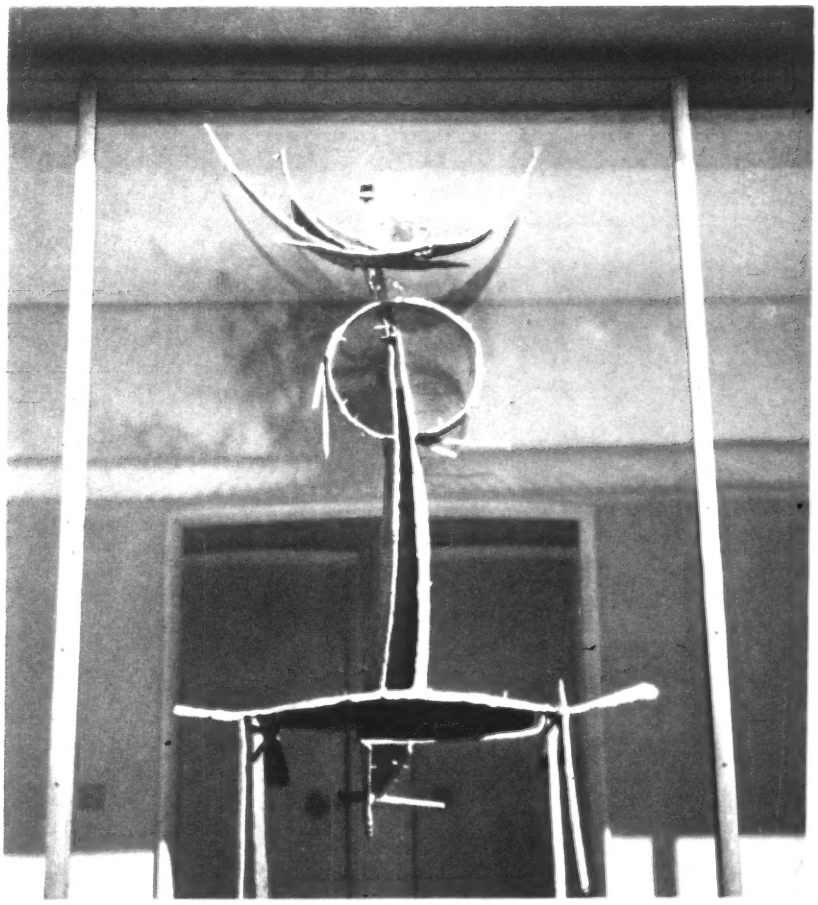
Gardens involve maintenance, and more than one pretty forecourt to a school or factory has gone to the winds on this point. In the Span schemes residents buy long leases—£2,500 to £3,000—knowing that thereafter they assume a share of responsibility for upkeep. Span pave and plant the gardens well and even lavishly. (The LCC have borrowed their tree list.) Then the residents' committee takes over and employs a gardener. This works well. Only if major planning or structural change is wanted do the committee refer the matter back to Span as landlord, and thus indirectly to the architect. In fact resident co-operation, of its own volition, goes rather further than this; on at least one scheme—the recently designed and very charming little square at Teddington—it has clearly been extended to such things as the window curtains.

Not that the schemes are stereotyped; the unit plan both of flats and houses does of course repeat, 27, but just as the town-planning forms—size and shape of gardens and blocks, etc.—have to adapt themselves to the exigencies of the site, so does the planting adapt itself to the character of the site. At 'The Priory,' Blackheath, one side of the larger garden court, for instance, is left unenclosed so that it may be looked down upon by an old stone tower. In this scheme, since there are virtually no old trees, herbaceous planting and flowering shrubs are used in profusion. By contrast 'The Hall,' Blackheath, has several fine old trees at its heart, and consequently mown lawns rather than flowers is the main theme. In the tiny square at Teddington each house, it is true, has its own small plot of flowers, but the smallness of the scheme as a whole demands a very simple treatment, which it gets.

The detailed planning, the equipment and the architectural detail are all, by now, well known to architects. This article has emphasized rather how these things find their starting point in, first, the social situation and then in the landscape design. Landscaping is not just a desirable but expensive 'extra.' The other thing that has been emphasized is the whole Lyons-Townsend-contractor-resident relationship. The nineteenth-century conception of the architect as a professional gentleman—analogous to a doctor or lawyer—acting as agent for another gentleman, is not a conception that has in any case been valid for more than a very small slice of history. It is crumbling all the time now. The place of the official architect, of the civil engineer and of the spec' builder in our civilization is the proof. What Lyons has done, however, is to show that if the architect, instead of remaining aloof in an unreal world, can break in on the vicious circle at the right point, he will—rather surprisingly—be found indispensable.

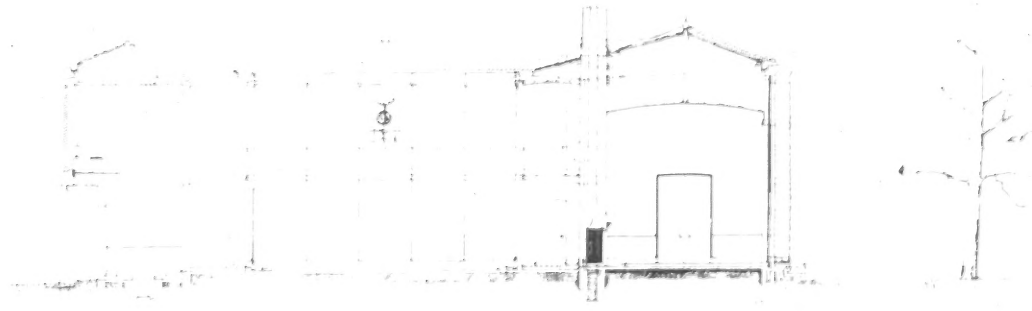
ID

a monthly review of interior design



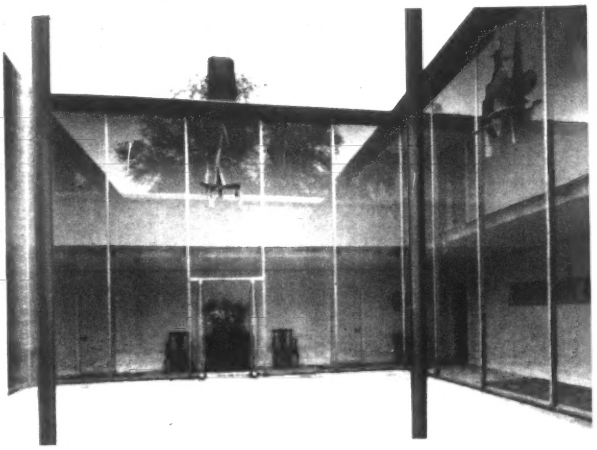
House for the Principal of Newnham College, Cambridge

architect: Louis Osman



section through entrance, courtyard and drawing room.

house for the principal of newnham college



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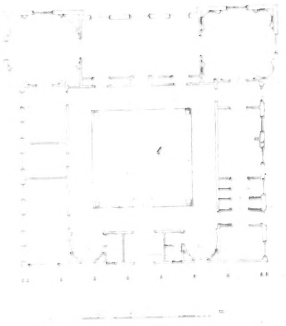
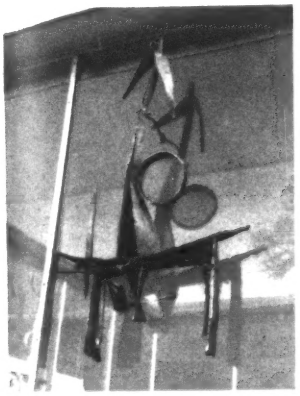
The interior courtyard of the house with sculptures of the four seasons seen against the glass walls.

←2



ground floor



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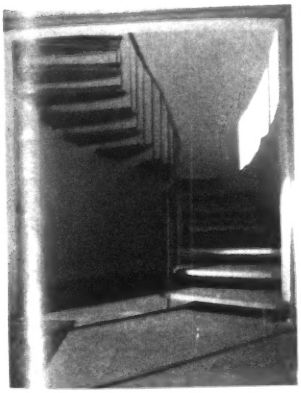

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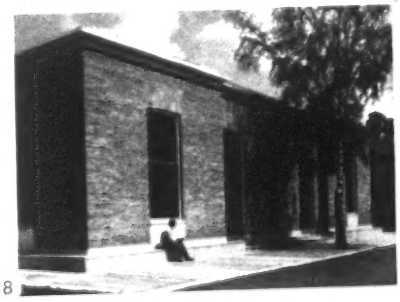
The house is planned as a perfect square, surrounding an open courtyard (see section on page 121 and plan above). 2-6, sculptures of stained glass and aluminium by Geoffrey Clarke, representing the four seasons, were provided by a legacy to commemorate 'the noble work of women in the Great War.' They are suspended by stainless steel brackets from the clear glass walls of the courtyard to give a jewel-like and three-dimensional effect. Each season is represented by a plant-like form symbolizing man: spring, 6, the young plant moves upward through the horizontal plane representing the surface of the earth; summer, 1, shows the plant open and blooming; autumn, 5, with the plant past its prime, and winter, 4, the plant dying and the cross-shaped root fully developed, symbolizing man's soul. 7 shows one of the cantilevered twin staircases, with ash treads carried on aluminium cast brackets. The solid outer walls of the house, 8, allow the roof and gallery to be cantilevered.



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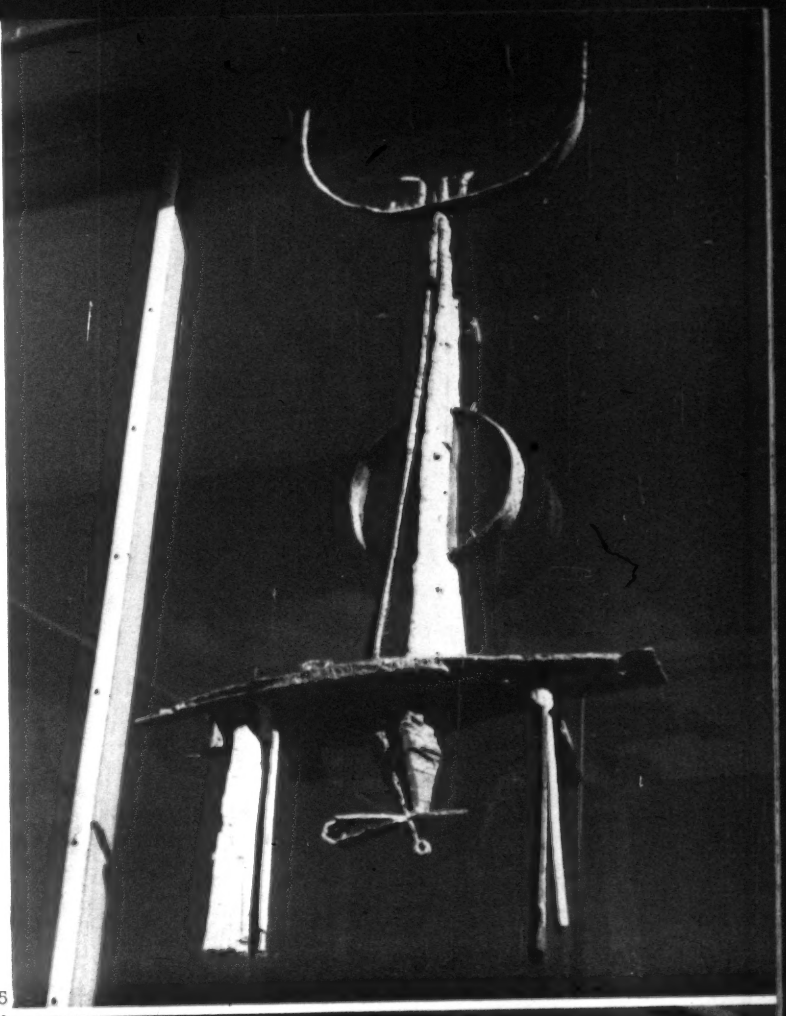

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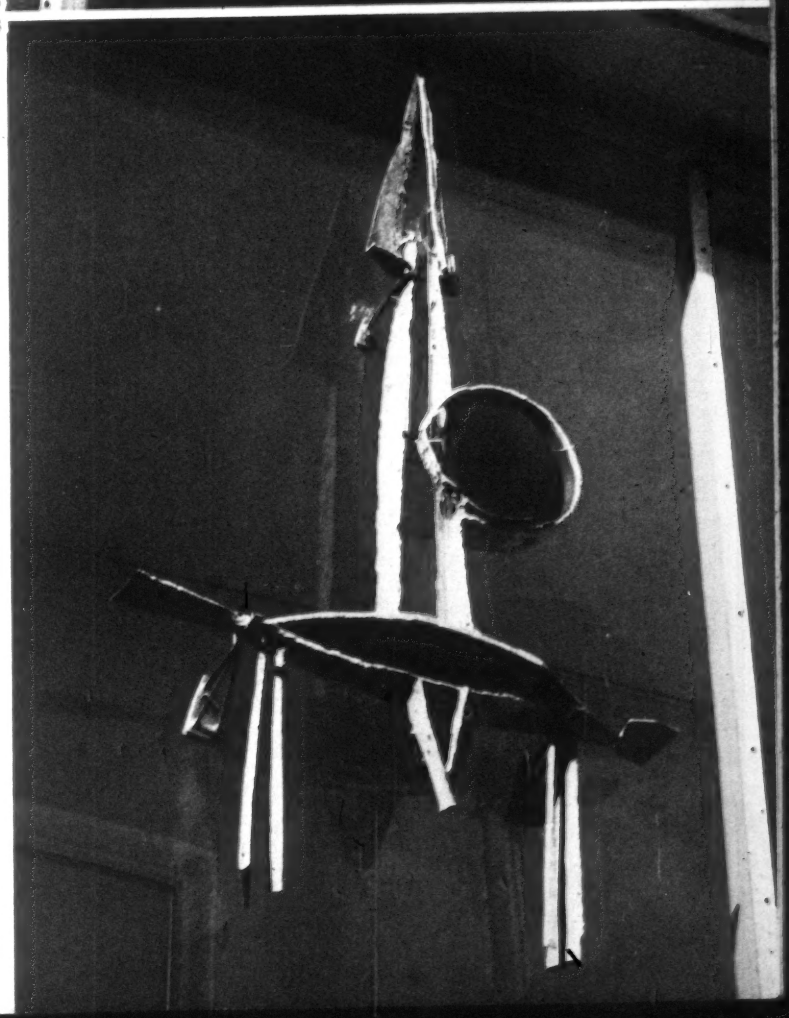

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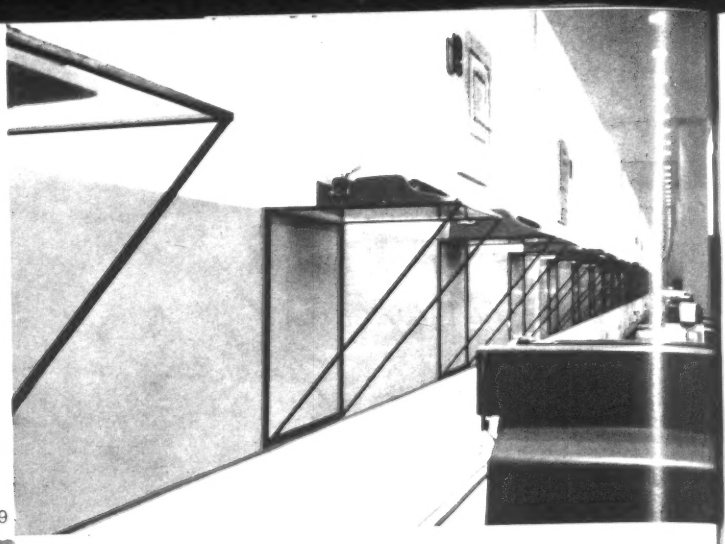

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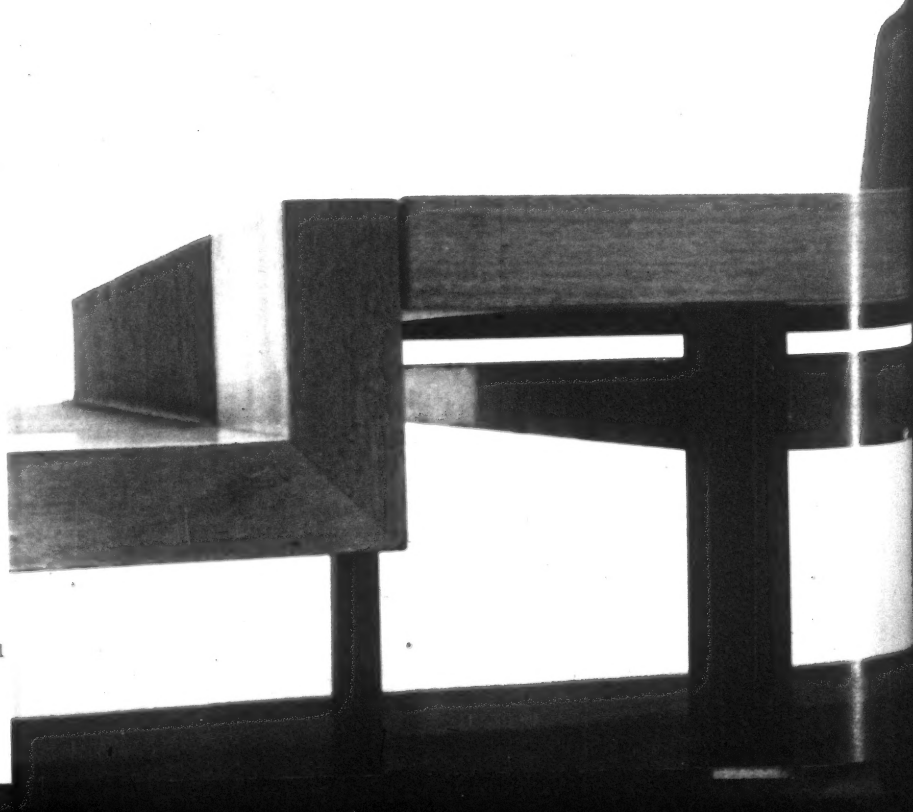
10

Offices in Berkeley Square

designers: Misha Black, and John Diamond

The new head offices for British Olivetti Limited are at 30, Berkeley Square, a new building on the corner of Davies Street. They cover 18,150 square feet on three floors. On the first floor of the offices is the Reception Hall, Managing Director's suite, Sales Offices and a large room which doubles as Meeting and Display Room. 10, in the Reception Hall plaster walls painted olive green, blue and black alternate with cedar veneered doors and panelling. The cedar veneer is laid in 3in. wide leaves to provide a ripple of pattern on the flush walls. There is a cork floor and an acoustic tile ceiling with recessed lighting. The reception desk is a standard Olivetti design. Behind the desk an obscured glass screen with black steel supports conceals a small mail office. 9, in the Meeting and Display Room the length is emphasized by the continuous cedar veneered horizontal



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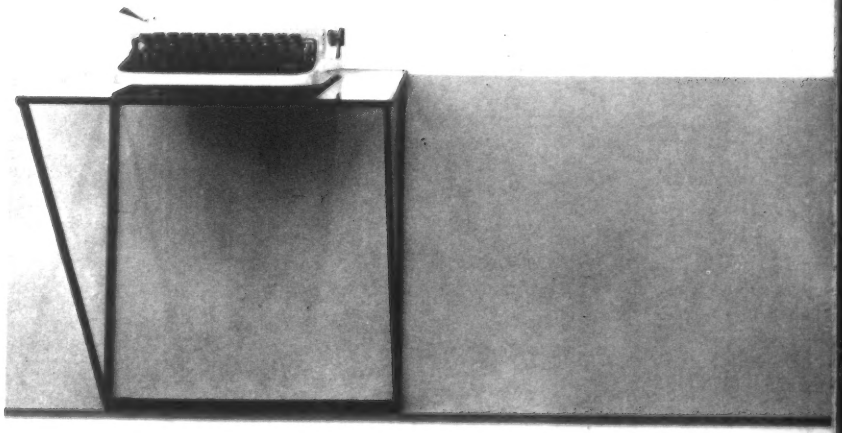

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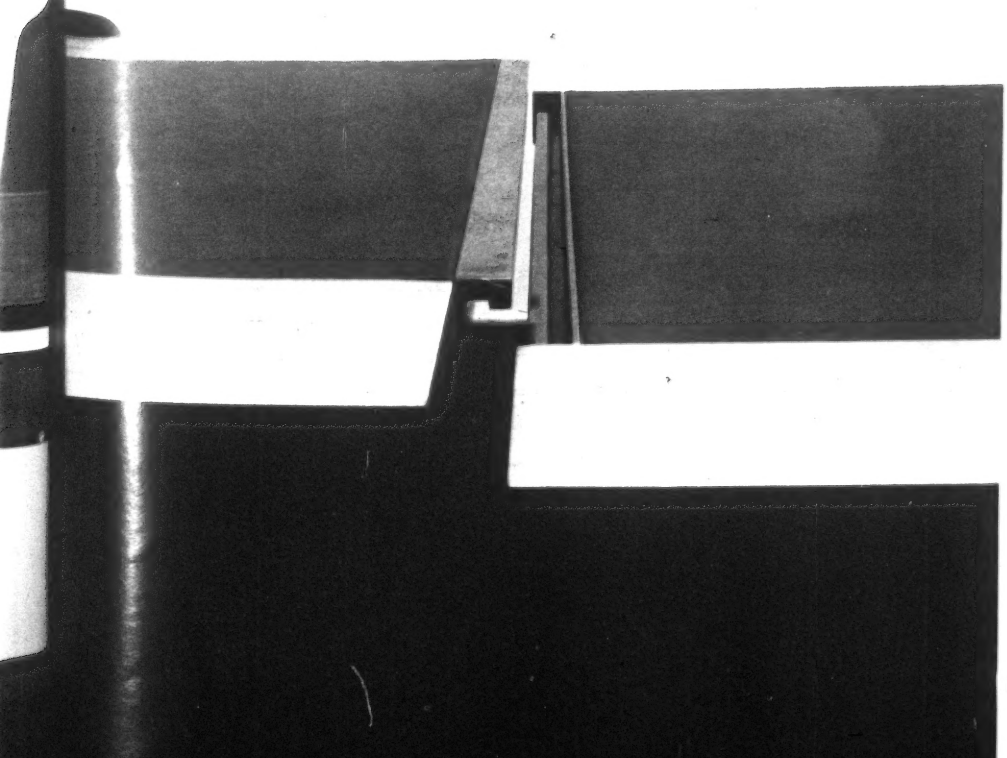
lighting panel and by the design of the display recess which is extended by mirrors at either end.

12. The typewriters and calculating machines are displayed on glass shelves suspended from a yellow coach-work finished blockboard band.

13. on the wall behind this there is a mosaic panel in black, grey and gold illustrating the Olivetti sign. More machines are shown on small tables at typing height.

11. in the centre of the room narrow table units can be assembled to form a continuous table for meetings, or intermediate leaves can be replaced by lower display tables at typing height when the room is being used for display purposes. The units are made of agba with grey leather tops.

14. the leaves fit together by means of interlocking aluminium extrusions.



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DR

design review

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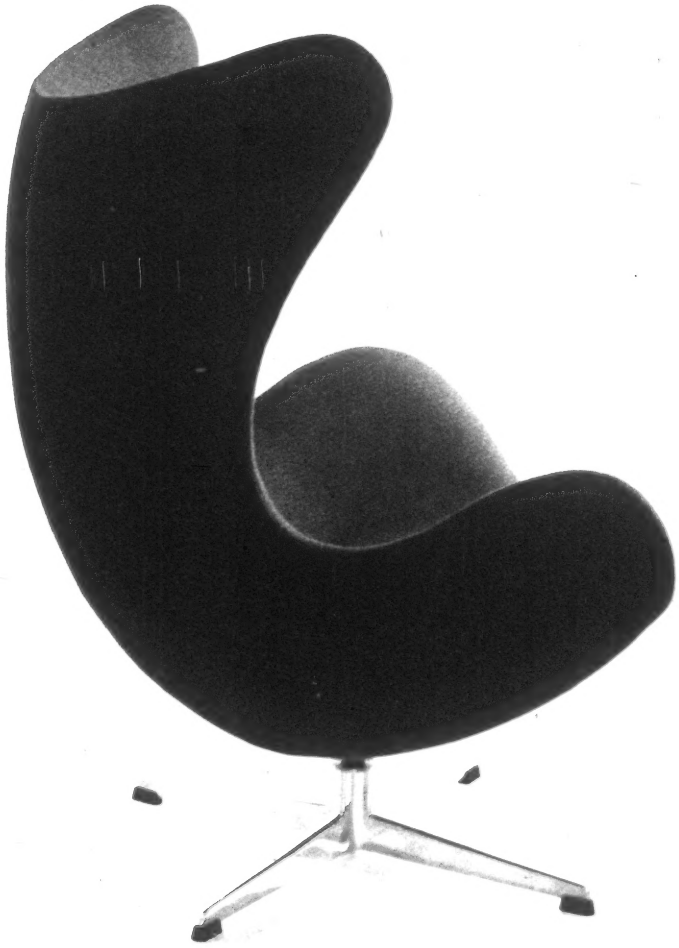


Jacobsen chair

1. Professor Arne Jacobsen was one of the first designers to break away from the traditional use of timber in Danish furniture manufacture. His latest design is the classic chair called the Egg. The shell is fibreglass and is supported on a chromed steel swivel base. The chair is made by Fritz Hansen, of Copenhagen, and will be sold here by Finmar next Spring (see also Miscellanea, page 140).

new fabrics

2. Shura Brae, by William Scott, one of two designs from Edinburgh Weavers' latest range of screen prints, is printed on a heavy cotton tweed which was specially constructed to interpret the texture and

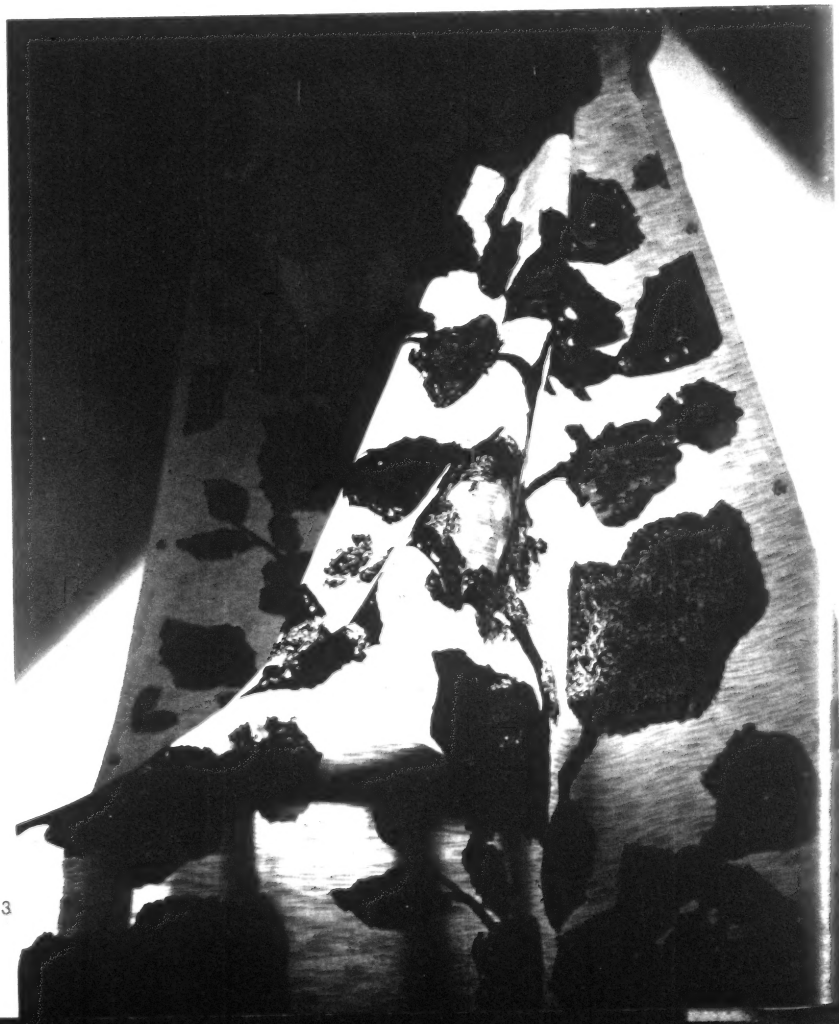
2

spirit of the original design. The pattern is reminiscent of large lumps of stone and is called after a Stone Age building in Orkney.

Painters do not often produce successful fabric design. Many overlook the inherent qualities of the actual cloth and the designs are lost in drapery and matchboard. William Scott has produced here a design with all the vigour of his painting which still manages to fit the flow of fabric. It is made in blue, gold and green, is 48 in. wide and the retail price is 30s. per yard.

3. Shepherds Hey, by Jo Lee Lowndes, is a fresh and freely drawn design based on roses. It is printed on a new closely woven slub cotton, introduced to provide a material suitable for coverings as well as curtains.

The colours are gold green, blue green, red orange or black orange. The approximate retail price is 25s. 6d.



3

ARR IN PORTUGAL

The label 'of York' attaches to John Carr's name with the persistence of an Homeric epithet, and makes it difficult for us to visualize him designing even beyond the borders of that county, let alone overseas. Yet, as the following article demonstrates from unpublished correspondence in Portuguese archives, he undoubtedly designed the hospital of the Misericordia in Oporto, whose façade is seen above.

An alliance between England and Portugal has existed since 1373 and trade between the two countries has resulted in small numbers of English people living in the larger towns of Portugal. In Lisbon, there has been for centuries a British community. In the second city, Oporto, famous for the export of the red and white Douro wine, the powerful association of English companies which largely controlled the Oporto trade, built in 1785 a fine headquarters known as the Factory House. Complete with banqueting hall, dessert room and ball room, it is still being used by English residents as a clubhouse.

The only book on Portuguese architecture which is easily available —Walter Crum Watson's *Portuguese Architecture*—contains on page 269 a reference to the English factory in Oporto and to the hospital. 'The plans of both have clearly been sent out from England, the hospital especially being thoroughly English in design . . . (it is) not unlike what might have been designed by some pupil of Chambers.' English in design, certainly, but hardly in the style of Sir William Chambers or one of his limited following: another more likely architect of the period must be sought.

In December, 1779, a meeting[1] took place at the Assembly Rooms, York: a committee was formed and a petition sent to the Commons requesting Parliamentary reform 'to correct the grofs Abufes in the Expenditure of Public Money.' The action provoked the Marquis of Rockingham, that conscientious Whig politician, to write a letter[2] of considerable length, outlining his views to a certain York alderman, a member of the committee. After discussing the precarious position of the country and the incompetence of those in power, he illustrates a point thus: 'I should suspect that it may have happened not infrequently, that you have heard *ingenious Gentlemen* descant much upon *Architecture*. The Ideas and Theories might be *very pretty;* and yet you from knowledge acquired by experience & also from better information of the nature of the materials of which houses are built—have been forced to pronounce that such buildings were fit only for *Castles in the air* and would not do on this *Terrestrial Globe*.'

The opening paragraph of the letter indicates the profession of the alderman—'I much wish your letter had brought me a satisfactory account of the state of your health. If it was not time of war—I should almost recommend to you a sea voyage to a warm climate. I don't know whether *the grand plan you sent to Lisbon* has been carried into execution, it might do you good to go & look.' The letter concludes 'I am ever, Dear Carr, your affectionate friend Rockingham.' The architect's 'grand plan' may have travelled via Lisbon but it was destined for Oporto, there to be erected as the hospital of Santo Antonio.

John Carr (1723–1807), son of a building surveyor and bridgemaster, an alderman, J.P. and twice Lord Mayor of York, was the most successful Yorkshire architect of the eighteenth century. By 1779 (the date of Rockingham's letter) he had designed public buildings—the Basilica at York and grandstands at York, Nottingham and Doncaster racecourses; he was performing the duties of bridgemaster to the North Riding and had built Greta Bridge and Ayton Bridge; and he had erected numerous large country houses—including Constable Burton, Harewood House, Thoresby Park, Basildon Park and Denton Park. He was at this time engaged on the Crescent at Buxton for the Duke of Devonshire and on extensive works at Wentworth Woodhouse for the Marquis of Rockingham, the chief patron amongst Carr's many titled and influential clients, any of whom might have carried his fame to Portugal. One, for example, whose family had traded with Oporto and for whom Carr most likely carried out work at Blyth Hall, was his friend William Mellish, M.P. and Receiver of Customs. Another, chaplain to the English Factory in Oporto and for whose family Carr later carried out work at Bollings Hall, near Bradford, was the Yorkshireman Dr. Wood; here the connection is very close, for Carr's letter, quoted later, shows that Dr. Wood acted as an intermediary between architect and client in the early stages of the project. However, the man finally instrumental in the appointment of Carr as the architect for the hospital was most probably John Whitehead,[3] British Consul in Oporto for fifty years and close friend of General João de Almada e Melo, Military Governor of the city and one-time President of the Council of the Misericordia, the organization responsible for commissioning the erection of the hospital.

The brotherhood or benevolent society, known as the Misericordia, was founded five hundred years ago by a queen of Portugal for the care

[1] Political Papers of Revd. Christopher Wyvill (1794–1804).

[2] Wentworth Woodhouse Muniments, Rockingham letters.

[3] John Whitehead is *said* to have designed the British Factory House (1785) and the British Church in Oporto. He was a mathematician and draughtsman, assistant on town planning to General João de Almada e Melo and adviser on weights and measures to the Marquês de Pombal, famous Portuguese statesman. Equally well the design could have been contributed by Carr.

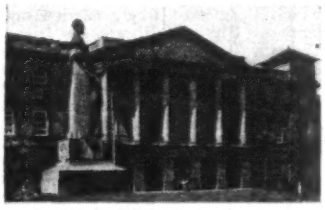
of the sick and needy; today it manages various hospitals and institutions in most of the larger Portuguese towns. In 1766 and 1767[4] its board decided that the existing hospital was unsuitable and insufficient for the needs of the growing city and that a new hospital ought to be erected outside the city walls large enough to treat and house the thousands of unfortunates, both Portuguese and foreign, who every year flocked to the Casa to seek Christian charity. The President of the Santa Casa at this time was Don Antonio do Lancastre and it is to him that John Carr wrote the covering letter[5] to his design:—

May please Your Lordship,

At the request of the Rev. Dr. Wood, Your Lordship will herewith receive the designs I have made according to your instructions for the General Hospital proposed to be erected at Oporto under your noble influence, which I flatter myself you will find conveniently designed for the purpose, and Worthy the patronage of the most noble Don António de Lancaster.

I very much lament my being prevented the honour of corresponding with your Lordship on this important subject, by Dr. Wood's not acquainting me in due time with Your Lordship's instructions to Dr. Goold in March or April last, those instructions by reason I believe of Dr. Wood's indisposition were not communicated to me until 20th July, at which time I had completed my design, and waited with impatience to be informed how I might send the design to Your Lordship.

Fortunately, Dr. Wood arrived in this city yesterday, on account of his health and an opportunity now offers by which I can send Your Lordship the drawings immediately . . . by Capt. Sconswar (who I have impowered to receive it) an adequate gratuity for so complete design as I have sent you; a design which the King of England has seen with admiration and approbation. He desired to see it, having heard so great an account of it and of the Noble Founder Don António de Lancaster from a great many Noblemen of my acquaintance who waited on me to see the designs and general instructions which Your Lordship sent me by Dr. Wood.



1, *central block of the main elevation.*

Your Lordship will please to observe I have so particularly put down the measures of every part of the plan and elevations that the workmen may build from the drawings every minute part thereof, which makes the design of much more use and value, the doing of which with such care and exactness, have indeed been a work of such Time and Thought that nothing could have induced me to have undertaken at a time when I am conducting so many Magnificent Structures for several Noblemen and others in the Kingdom . . .

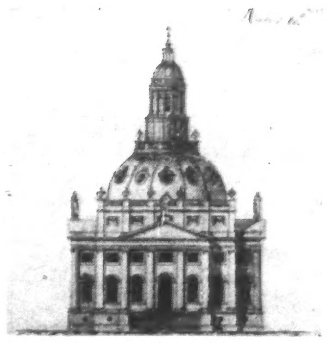
Be pleased to give me leave Most Noble Lord before I conclude, to observe that I shall be very sorry to anticipate Your Lordship's generosity by setting you a price upon this extensive Plan, yet in justice to my experience and abilities in architecture and the esteem and reward which I receive for my designs in England make it necessary, perhaps, for me to inform Your Lordship that £500 would be thought but a very moderate reward for such a design in England. But the honour and pleasure of being employed by Your Lordship and the hopes I have of seeing some part of the design erected I shall not ask more of your Lordship than the above sum of £500. . . . Which sum I desire your Lordship will remit me by my acquaintance Captain Robert Sconswar who is a man of Credit . . .

My Lord on all occasions
Your Lordship's most obedient
most humble servant
John Carr.

York, August 7th, 1769.

The plan was accepted. It formed a vast rectangle, the frontages measuring about 540 feet and the sides about 520 feet, with an immense interior court, in the centre of which was a chapel. The ground having been bought, St. Anthony was chosen by vote as the patron saint—significantly the majority of the members of the board were called Anthony! Funds at the disposal of the board were inadequate but, being augmented by 'Divine Providence and Bequests,' the foundation stone was laid on June 10, 1770, with great pomp and ceremony. Owing to the existence of a stream[6] and the irregularity of the site, the foundations are in some parts said to be 100 palmos below ground level and those to the outer walls 50 palmos in thickness. The construction is entirely of granite from quarries north of the town, and of stone from part of the old town wall which was demolished soon after building started on the hospital. The wall thickness is also colossal, seeming more suitable for a fortress than for a hospital; the building was, in fact, struck several times by cannon balls during the Civil War at the seige of Oporto, in 1833, yet suffered no damage.

Work was first commenced on the southern angle of the building and continued until 1780 when it was suspended owing to lack of funds. It is probable, incidentally, that Carr was kept informed of the progress by Whitehead who forwarded to the Board of the Misericordia a translation of a letter written by Carr from York dated February 4, 1777, in which he criticized the alterations made to his plan by the local builders and the Board of Directors. He made various suggestions as to what should be done to avoid spoiling the proportions and symmetry of the building. Work recommenced in February, 1791, with the proceeds from a lottery which was authorized in aid of the Misericordia, two-thirds of the total profit being allocated to the continuation of the building work. In the meantime, the original plans of John Carr had become so disfigured and damaged through want of care that they had to be recopied. This was done by a man recommended by Whitehead but the originals have disappeared.



2, *Carr's drawing for the hospital church.*

By August, 1799, the building was sufficiently advanced to permit the transfer of patients from the old hospital. The townsfolk were invited to help; the first to be moved were the women who came in army waggons, carts and sedan chairs. The work of distributing the sick in the wards according to the plans of the doctors went forward until dark.

But building work still continued and more wards were opened. In 1807–12 another interruption was caused by the Napoleonic Invasions,[7] all the available money being used to treat the wounded or to support the widows and orphans. In 1824, the old hospital was finally abandoned, and building resumed at the new until 1832 when the Civil War and the siege of Oporto occurred. Work started again in 1837, but, in 1843, was discontinued and never resumed on John Carr's design. The original rectangular plan was not realized, only the main frontage and half the length of the two sides being completed. Even so, observers will agree with Crum Watson that 'the hospital is yet a fine building, simple and severe. . . . The only thing, apart from its unfinished condition,[8] which shows that the hospital is not in England, are some colossal figures of saints which stand above the cornice. . . .'

The design is one of the best Carr ever produced: the variation in the grouping and size of the elements together with the play of masses in receding planes at first-floor level, creates a bold and lively effect. Many of his other designs are satisfactory on paper but lack movement in the third dimension. The entrance elevations of Harewood House and Basildon House illustrate Carr's disability in this particular. Several elements of the hospital can be recognized elsewhere in Carr's work. The rusticated basement storey with the circular headed openings and inner surrounds of plain ashlar, occurs in the Town Hall at Newark; the steep pediments in the projecting links are reminiscent of Mr. Royd's house at Halifax, designed about the same time; and, of course, the vases breaking up the skyline are to be found throughout his designs. Comparisons of buildings can lead to surprising parallels and tempting theories. The central block of the main elevation of the Hospital with the great sexastyle portico in the middle, and the end pavilions with Venetian windows, 1, invite comparison with the south elevation of Wentworth Castle. This elevation, lauded by Walpole in the belief that his friend Lord Strafford was the architect—'Nothing ever came up to the beauty of it. The Grace, proportion, lightness and magnificence of it are exquisite'—was, at one time, attributed to Carr but more recently has been disallowed, partly on the grounds that he had never elsewhere done anything in the same style. The similarity between these two elevations makes it permissible now to reintroduce Carr's name to Wentworth Castle.

No parallel can be found to compare with the design for the hospital church, 2, fortunately perhaps for Carr's reputation. The detail may have become debased in the copying of the drawings and 'the colossal figures of saints' are doubtless a touch of local colour but, nevertheless, the conception is naïve and uninspired. Had the whole scheme been completed—the vast courtyard with the church in the centre—it would certainly have formed one of the most remarkable groups of architecture of the period in Europe.

Precisely why the Board of the Misericordia decided to purchase a plan from England for their hospital is also a matter for speculation. An earthquake had devastated Lisbon in 1755 and fear of a further calamity had caused the Royal Family to live in a range of wooden buildings at Belem, on the banks of the Tagus. Rebuilding commenced under the guidance of the energetic Marquês de Pombal and, no doubt, all those with architectural skill were employed on this urgent work, obliging the Board of the Misericordia to go farther afield for their architect. They may have known, through Whitehead, that Carr had designed a hospital for Leeds—opened in 1771, and described some years later by John Howard as 'one of the best hospitals in the kingdom'—and that he was building Bootham Mental Hospital, in York. They may even have heard that a spare design was on the market: it has been suggested that the Oporto plan was originally intended for one of the London hospitals but was turned down because it took up too much space. However that may be, the hospital had its effect on buildings at Oporto. Several, including the University, are built in a similar style.

Carr was no doubt flattered by being chosen as the architect of so large a project overseas for, although very successful in his profession, he had never set foot abroad nor had he made the Grand Tour like so many other fashionable architects of the time. In spite of this, he not only designed various projects in Ireland—as, indeed, did Chambers and Adam—but he also, as has been shown, achieved what is probably a unique distinction at the time, that of having designed a building for erection outside the British Isles.

Acknowledgment is made to:—Mrs. Susan Lowndes Marques, Earl Fitzwilliam's Wentworth Estates Co., University of Sheffield Grants Committee, Board of the Santa Casa da Misericordia do Porto, and most particularly to Mrs. Ruth M. Jennings, Chairman of the Executive Committee, Associação Luso-Britânica do Porto.

[4] Records of the Santa Casa da Misericordia do Porto. Secção D., Banco 8—Livro No. 7, Folhas 289–294, 306–7, etc.

[5] Ibid, Secção D., Banco 1—Livro No. 1.

[6] The same difficulty was encountered on the site of the Crescent at Buxton.

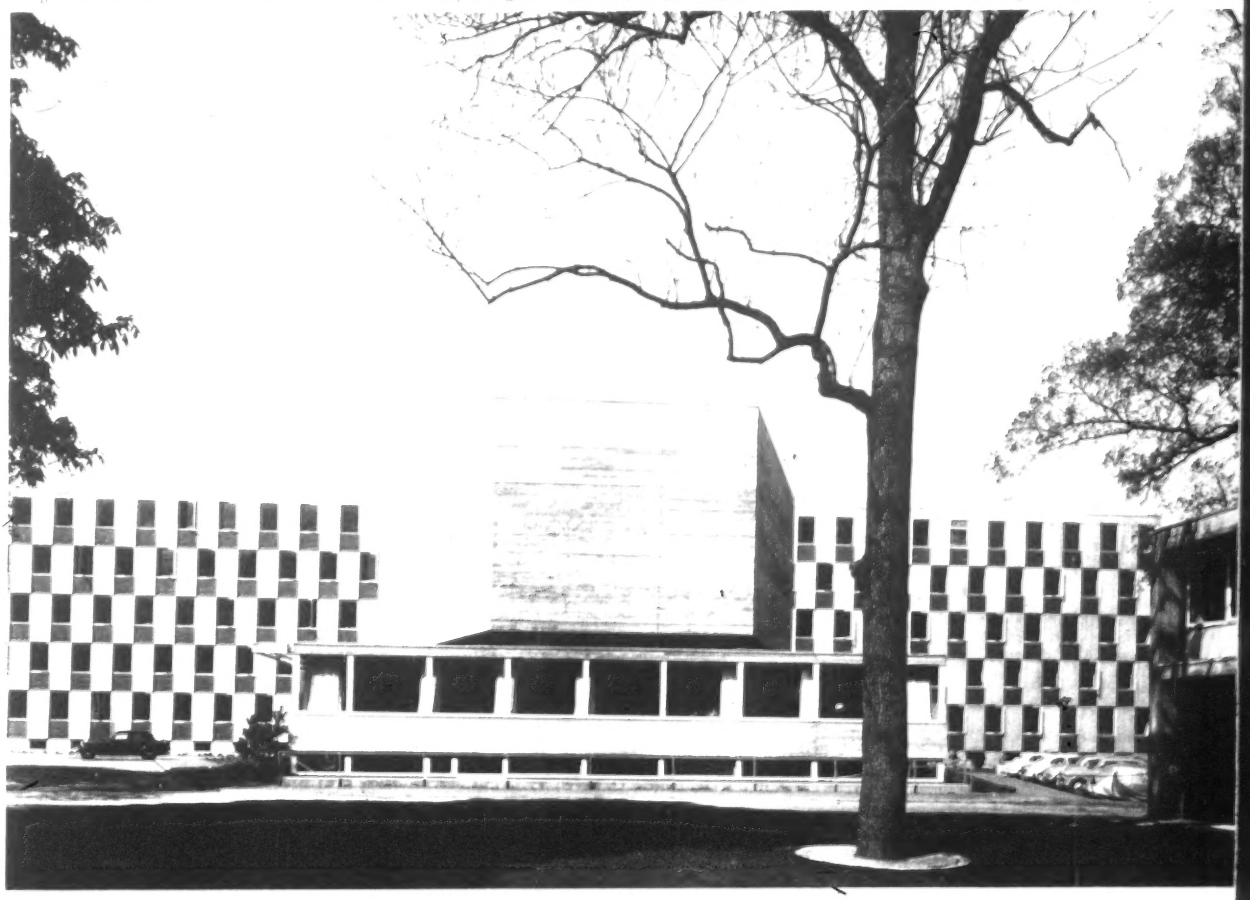
[7] Wellington's headquarters in Oporto were at the Palacio dos Carrancas, built in 1795.

[8] The main pediment was completed only relatively recently: the penthouses, including those with pyramidal roofs, were later additions to Carr's design.

current architecture

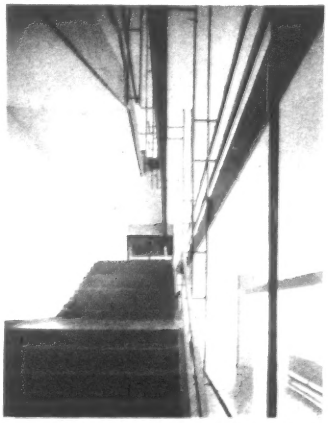
recent buildings of interest briefly illustrated

1. office blocks with terraced restaurant and three-storey hexagonal book store in the centre



OFFICES AT OFFENBACH AM MAIN

ARCHITECTS: CITY BUILDING OFFICE OFFENBACH AM MAIN
CHIEF ARCHITECT: P. F. POSENENSKE

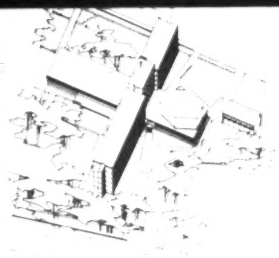


2. main staircase, rails are aluminium

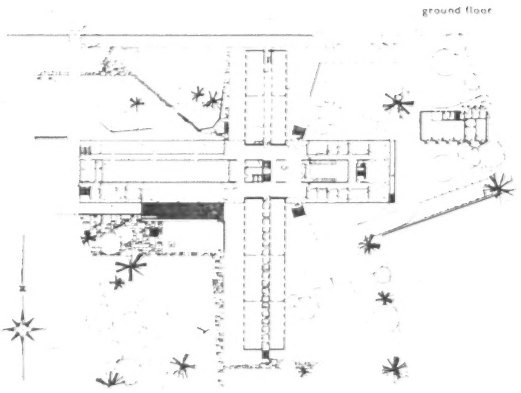
The State Building Office designed this block for the Federal German Republic's weather-information and climatological research departments, on a site which was formerly the park of a private house. A five-storey block of offices runs north to south, intersected by a one-storey wing incorporating a three-storey hexagonal book store, and library, lecture hall and a terraced restaurant. The external walls are of load-bearing reinforced concrete with windows alternating and set back from the surface of the wall. The main staircase is of black wedge-shaped concrete steps on sloping slabs. Externally the concrete has been treated with transparent silicone coating, and the woodwork to doors and furniture is in its natural colour.

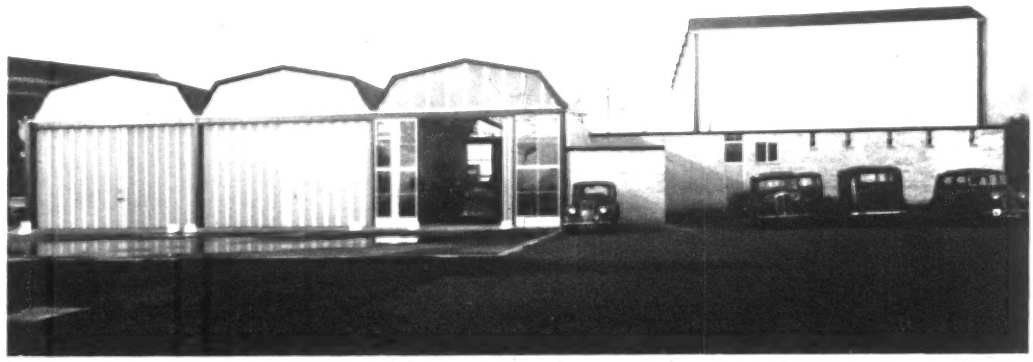
Offices at Offenbach am Main

3, detail of elevation showing windows of main staircase behind the hexagonal hook stair.

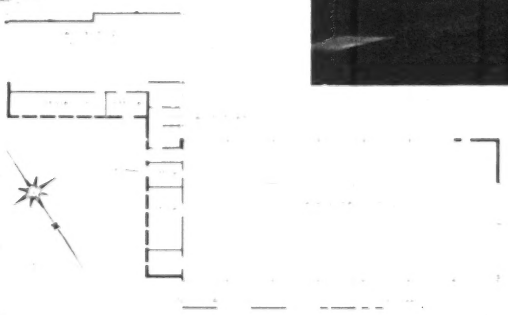


axonometric view



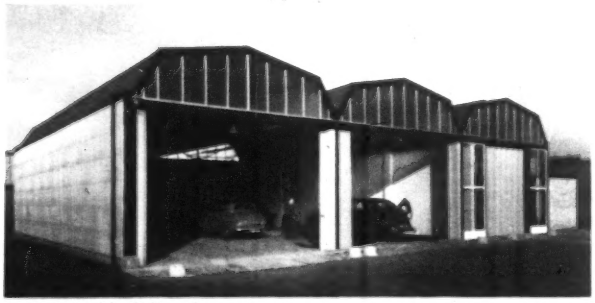


4, garage with research and development block on the right.



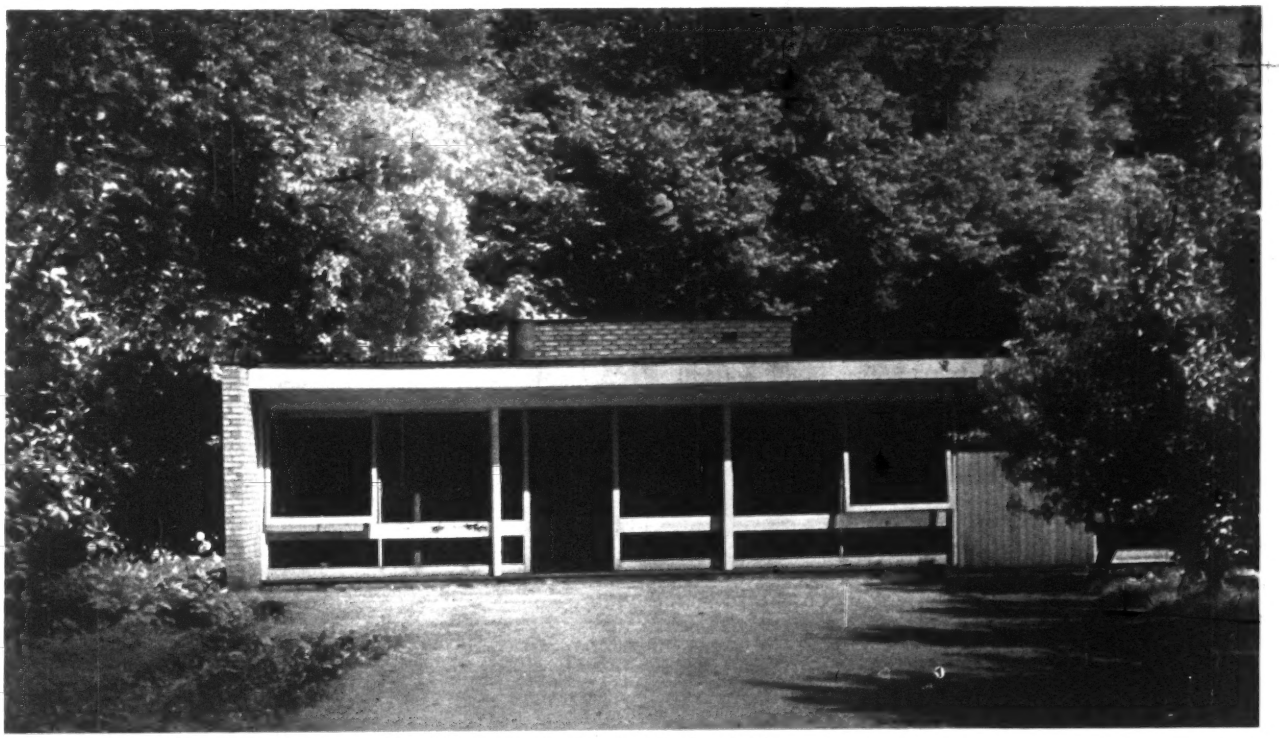
FACTORY AT WAKEFIELD

ARCHITECTS: R. J. MOCK AND R. E. ENTHOVEN



5, garage with sliding doors open.

This Research and Development block, with adjoining garages, at Horbury, forms part of a large scale factory redevelopment programme. Construction is of Leicestershire limestone bricks and patent aluminium cladding, which has been used for the first time in the area on an industrial building. The roof steelwork is of tubes and rods forming lattice girders on the joist columns. Internally the buildings are faced with 2 in. insulation board.



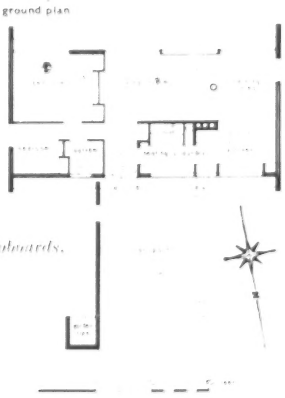
6, the south front facing bricks are salmon pink and the panel to the right is of hardwood strips.

HOUSE NEAR HYTHE

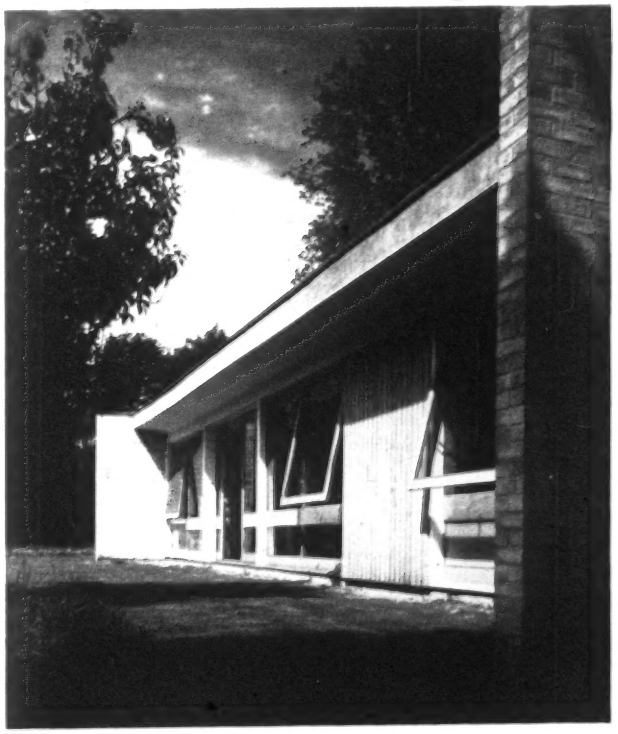
ARCHITECT: JAMES C. WILLIAMS

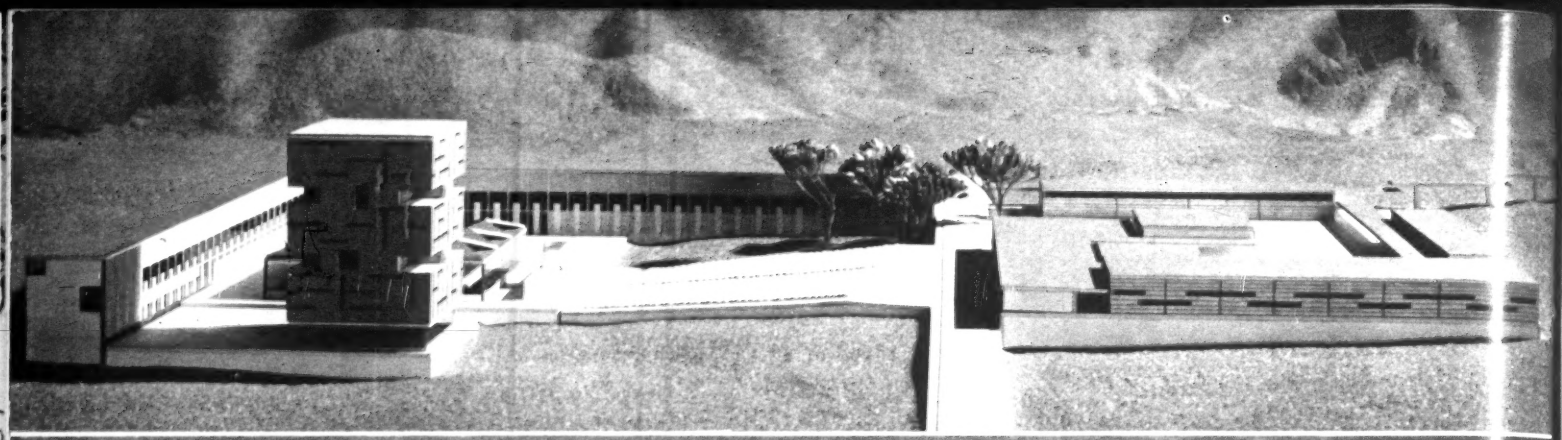
Built on a wooded site of two acres, this house at Saltwood looks south over a small orchard towards Hythe. It was planned for a young married couple and can be extended later for a larger family. The floor is a 4 in. concrete slab covered with hardwood strips carried on shallow sleeper walls. External walls are of salmon pink facing bricks and hardwood strip panels; internal partitions are of 3 in. breeze blocks. The roof is finished in 3-ply felt and aluminium. Thermostatically controlled heating is by solid fuel boiler, with two circuits serving the living room and kitchen, and the bedrooms and bathroom. Domestic hot water is supplied by a solid-fuel cooker and an immersion heater. The living room, dining area and kitchen have an open plan, with the free-standing fireplace providing the focal point. The service core is in the centre of the house, and all plumbing is internal.

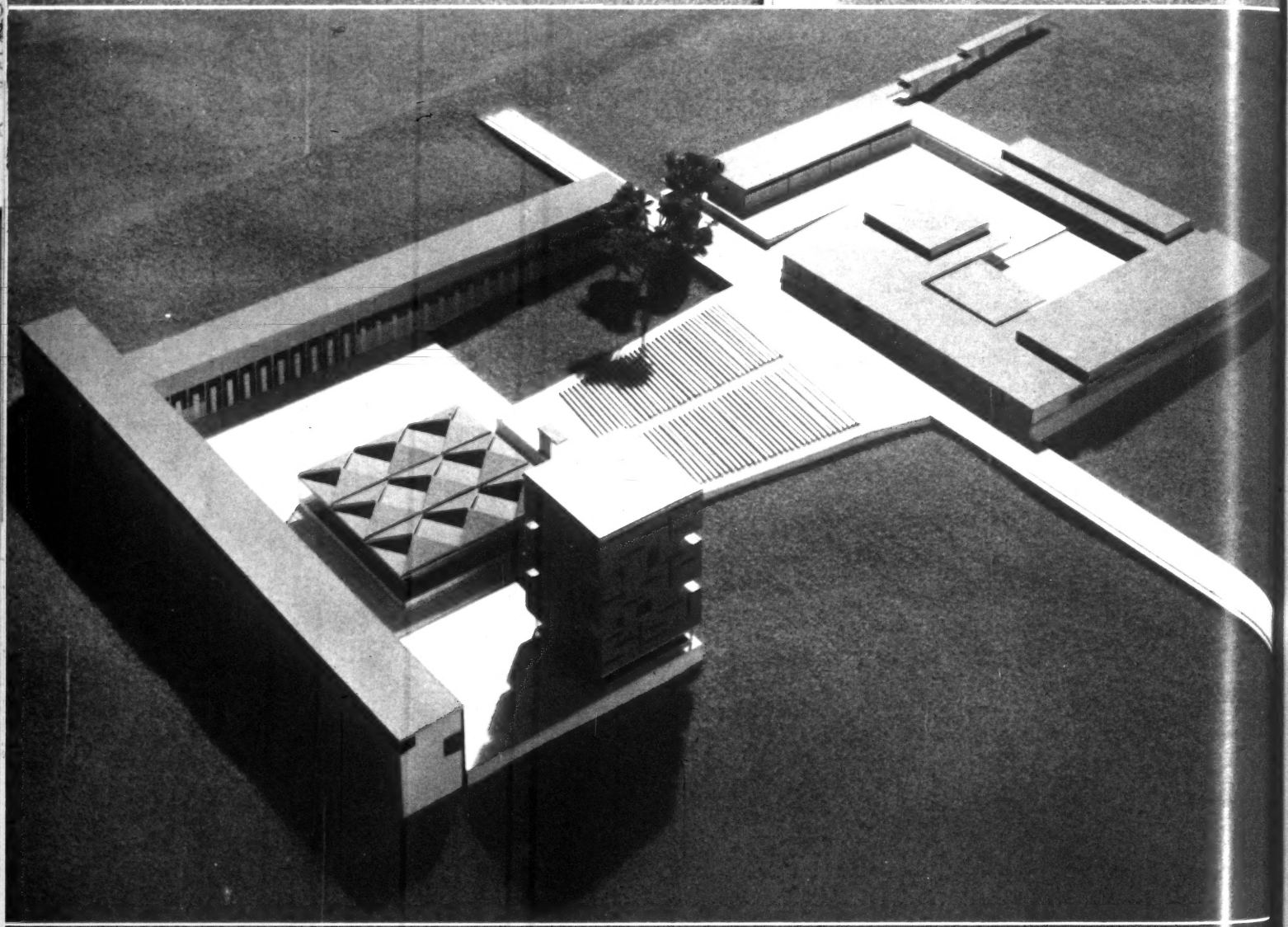
7, detail of living room showing fitted shelves and cupboards.



8, garden front looking west.

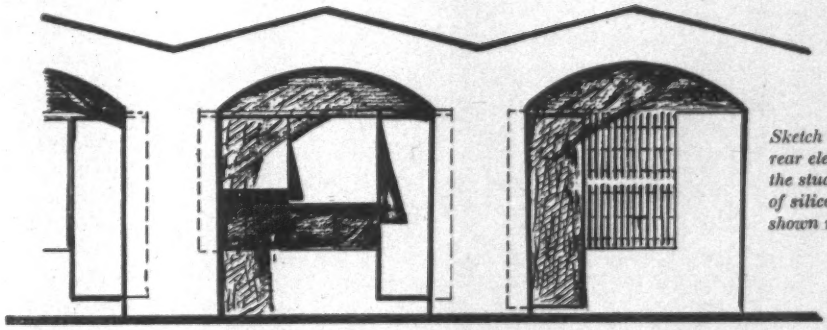






James Cubitt and Partners are a British office with a well-established connection with West Africa—their recent work on the Gold Coast wa described in the A R for May 1956—but the buildings projected for the University of Nigeria at Nsukka may yet prove to be one of their mo important works in the area, since the project is on a scale that is visually and academically comparable to the University Cities of Latin Americ

Since the first project for the University of Nigeria, the University Square of which is seen opposite in model form, was accepted, various modifications have been made to the scheme, on which work should begin shortly. Comparison of the plan (bottom right) with the photographs of the model, shows that the main changes are the transference of the library-tower to the other side of the spine road, alterations to the layout and alignment of the open-air theatre, an extensive rearrangement of the students' union which no longer encloses a court but runs parallel with the spine road. The arts faculty 'cloister' remains in its original position enclosing the square which contains the theatre.



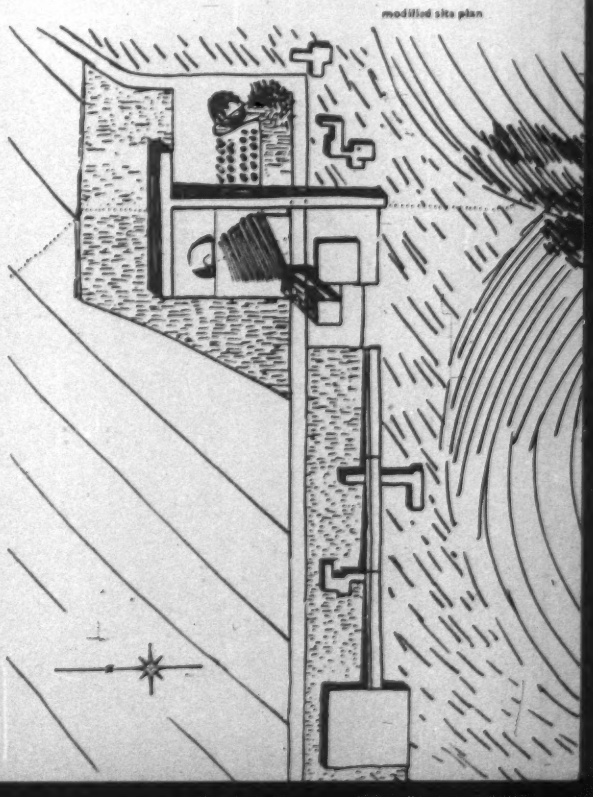
Sketch of the front and rear elevations of one of the students' residences, of silicone-treated adobe, shown in plan on page 136.

UNIVERSITY OF NIGERIA

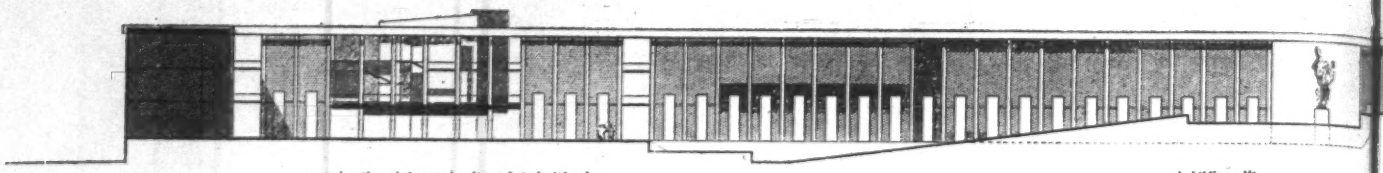
architects | **JAMES CUBITT AND PARTNERS**

The site of the university, at Nsukka some 40 miles from the capital of the Eastern Region of Nigeria, is in fine rolling country, overlooked from hills to the West, where part of the new town will be sited. These hills are rather smaller in size and scale than the Berkshire downs. They are used to determine the layout. First the site is looked down upon from the West and this leads to the emphasis on the academic buildings which should not be dwarfed by the volume of residential accommodation. Secondly, the central academic buildings are exactly sited to get the benefit of the fine backcloth of hills to the West. Thirdly, a bare shoulder of hill is intended to enhance the rigid forms of these central buildings and to be a part of the composition which they form. These considerations determined the layout with its main spine, a mile long, running from the Stadium and Sports Centre to the 'University Square.'

The university is for 3,000 students, about a quarter of them women. The university square is formed by the Faculties of Arts, Law and Theology, the Library, Administration, the open-air Theatre and the Students' Union. There is a cross fall of

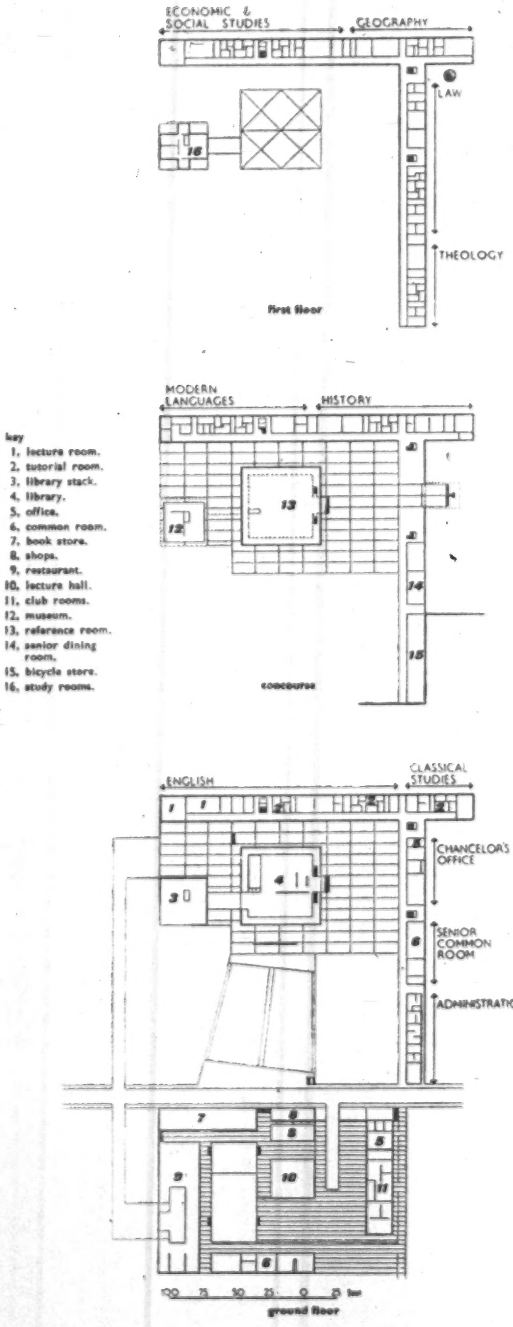


modified site plan



west elevation of the arts faculty and students' union

scale 1/64in. = 1ft.



key
1. lecture room.
2. tutorial room.
3. library stack.
4. library.
5. office.
6. common room.
7. book store.
8. shops.
9. restaurant.
10. lecture hall.
11. club rooms.
12. museum.
13. reference room.
14. senior dining room.
15. bicycle store.
16. study rooms.

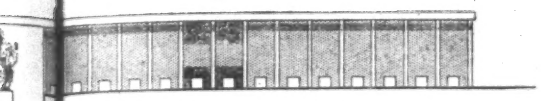
some 35 feet, down from the South-East corner. The main circulation is by a wide inward-looking passage (or cloister) at road level, from which the ground drops away until, at the North-West corner, there are two full storeys below cloister level. The line of the cloister is continued uphill to the Chapel on a small spur beside a beautiful natural cluster of trees. The Theatre (seating 4,000) follows the natural slope.

All members of staff will have private rooms which can be used for tutorials. Deans of the Faculties will have a small suite. The Library is divided in two parts, one a main reading room and the other a book stack, and so avoids a building of forbidding volume and makes building in stages more practical. The recently completed students' union at Nottingham was used as a guide to the accommodation in the students' union.

Immediately to the West of university square is the Faculty of Science and Engineering. The most important factors were flexibility and expansion. It was decided at the outset to allocate a substantial piece of ground as a 'backyard' for laboratories and workshops, some of which would be temporary structures as teaching methods and equipment develop and change.

Residential accommodation is tightly grouped. The men's halls of residence are to be single-storey with individual rooms of nearly 200 square feet. Some junior lecturers will be placed in charge of halls of residence and the remainder will be in individual compounds at the entrance to the university. The senior staff will be accommodated in 40 single houses, 54 terrace houses and 34 flats. The houses are to the South of the existing road, set out in groups of three. Terrace houses and flats, placed in a central position on the main site, will be landscaped in a park-like manner clear of the main line of vision from the university square westwards towards the distant hills.

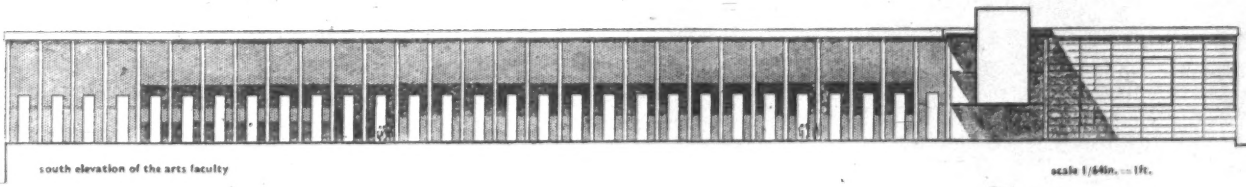
The soil on the site is suitable for making high-pressure building blocks and the men's halls of residence will be constructed of these blocks. Each hall for male students will house approximately 240 men, including seven lecturers, in small self-



UNIVERSITY OF NIGERIA

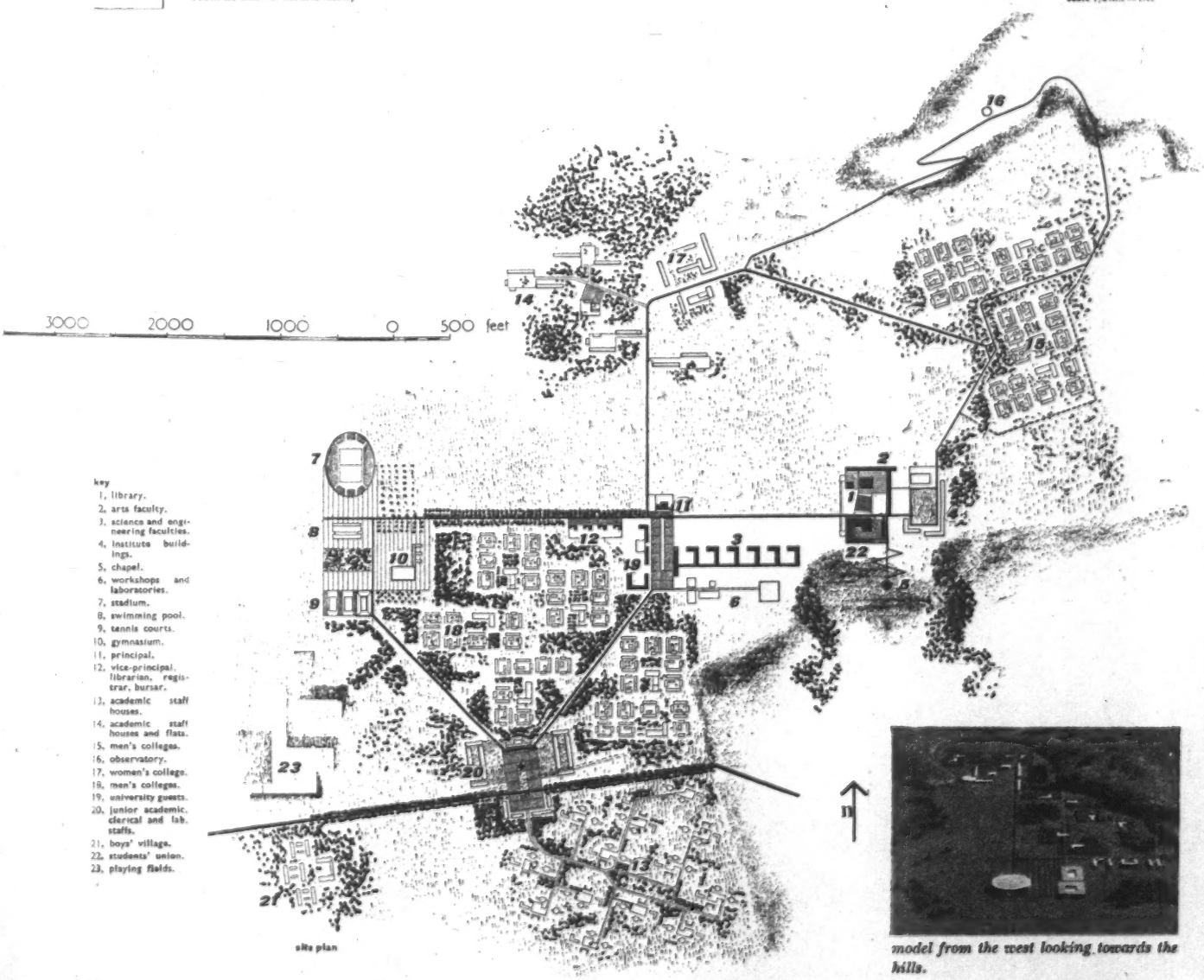
contained compounds. Two halls will share one dining hall. Designs for the women students are completely different. First they share rooms, secondly, the buildings are closer together, are of two storeys and have access stairs to pairs of rooms, and thirdly, a separate building is proposed to combine dining rooms, common rooms, visitors' rooms and a library.

At the North-West corner of the site are swimming baths and a stadium; detailed plans for those are not yet complete.



south elevation of the arts faculty

scale 1/64in. = 1ft.



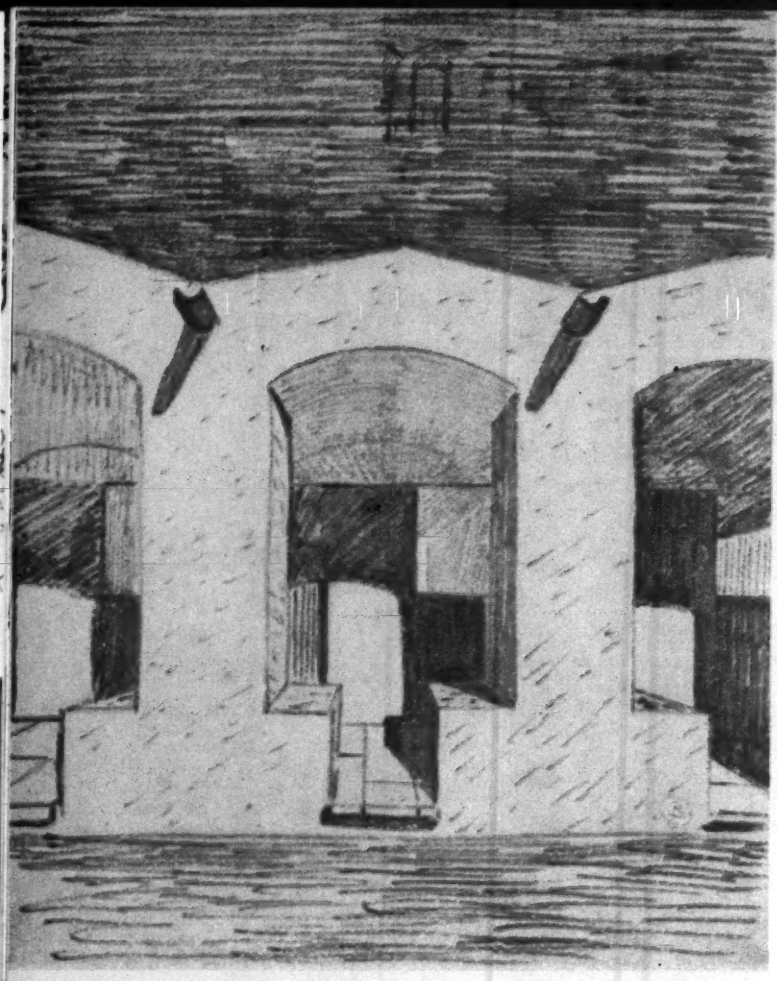
key

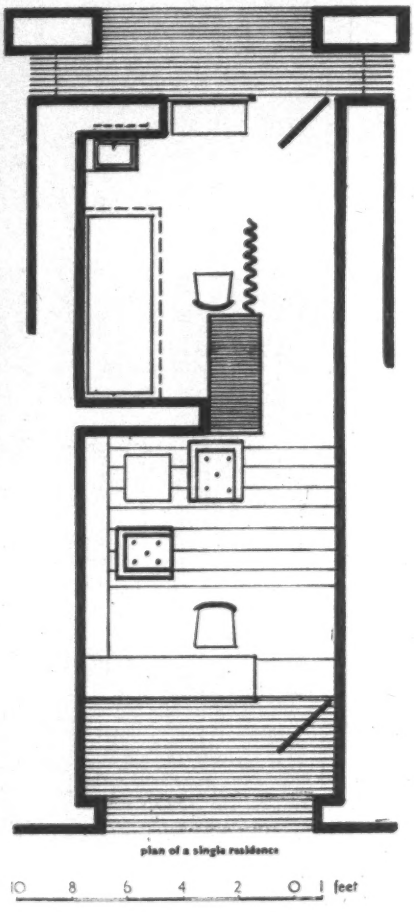
1. library.
2. arts faculty.
3. science and engineering faculties.
4. institute buildings.
5. chapel.
6. workshops and laboratories.
7. stadium.
8. swimming pool.
9. tennis courts.
10. gymnasium.
11. principal.
12. vice-principal, librarian, registrar, bursar.
13. academic staff houses.
14. academic staff houses and flats.
15. men's colleges.
16. observatory.
17. women's college.
18. men's colleges.
19. university guests.
20. junior academic, clerical and lab. staffs.
21. boys' village.
22. students' union.
23. playing fields.

site plan

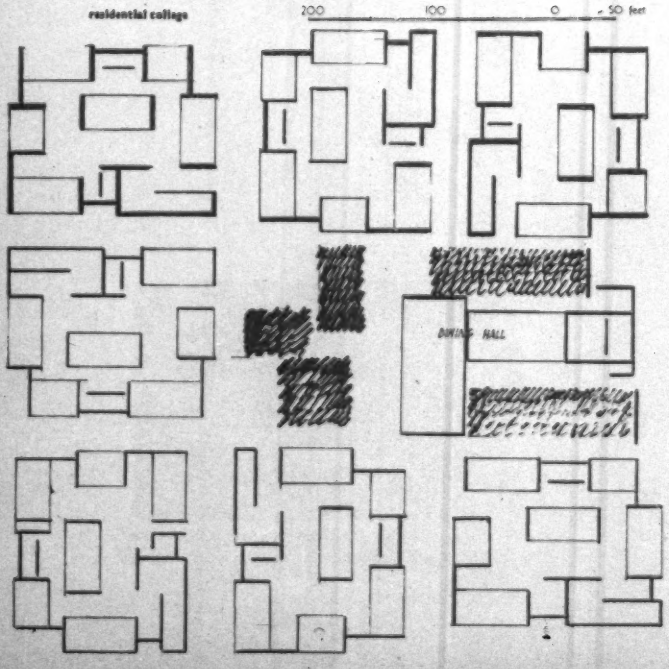
model from the west looking towards the hills.

UNIVERSITY OF NIGERIA

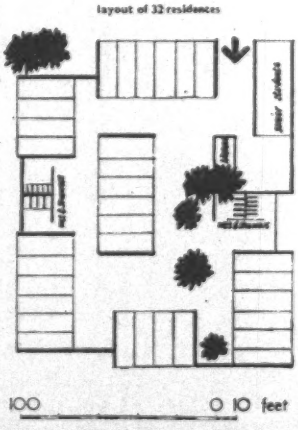




Preliminary sketch, above, of one of the residential blocks, which will be of pressed local soil, treated with a protective silicone solution. The plan, right, which is a later design, shows how through-ventilation is provided.



The residential college, left, is made up of seven groups of residences, with dining hall and kitchens. Each of the groups, shown in plan below, provides thirty-two residences with w.c.s and showers and a common room.

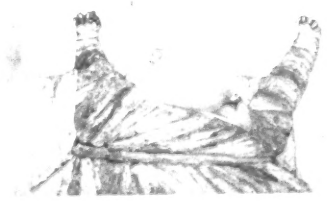


The name miscellany implies, of course, an architectural miscellany one that will include subjects which, though marginal to architecture, are nevertheless vital to it.

EXHIBITIONS

PAINTINGS

Evelyn Williams devizes fat babies with brutal tenderness; but to give complete satisfaction, every drawing and painting has to remain more or less the same as the example reproduced here. 1. One finds one-self resisting the slightest iconographical deviation: the child *must* be asleep and heavily swaddled, with arms stiffly raised and fingers curled, and there *must* be a vast area of plump cheek between the tiny nose-mouth configuration and the ear.



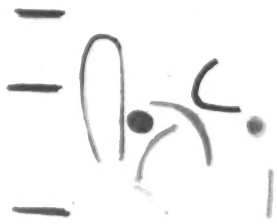
Actually, it allows for more variation than one might imagine: there is room for a few carefully considered changes in the position of the head and the angles at which the arms shoot up, and for endless adjustments of the situation of the child in the picture space. The artist has succeeded in hitting on a witty and sensitive formula that has the stamp of an archetypal image, and I see no reason why she shouldn't go on producing it for the rest of her life. But it's clear that she has different views on the matter, for there were only about half a dozen of them among the forty or so items which comprised her one-man show at the newly opened Woodstock Gallery in the street of the same name.

It's possible of course that she worked directly from the model and that the model has already toddled off, but whatever the reason may be, she is obviously preparing to forsake this satisfying image. She evidently shares with some of the Young Arts Gallery artists the desire to make the substance on her canvas with gloomy view of what is meant by the term "common clay," but it is mingled with a witlessness of drawing more reminiscent of a sophisticated primitivism of Lowry or Bossinghwaite. She has produced a number of cleverly simplified heads and figures in her search for an image as satisfactory as her sleeping child, but they are easily forgotten, and one's dominant recollection is of a number of oblongs filled with a whitish-grey blur of deeply grooved substance like dirty plaster. The best of these impossible alternatives to the sleeping child is a group of 'portraits' in which the shape of the head is not disclosed, but the magnified features of the face project from the surface as if a huge plaster cast were being gently pushed against a rolled-out, uncooked slab of whitish-grey pastry. If these 'faces' are likenesses, they would make a pleasant alternative to 'official' portraits and look austerely effective in modern board-rooms and conference chambers.

The Canadian painter Paul Emile Borduas, who has just had his first London exhibition at Arthur Tooth & Sons, has a superbly sumptuous facture. His pictures are done with the palette knife, and some of them closely resemble those of his younger but more famous compatriot, Jean Paul Riopelle; but he breaks away in his most recent works, which are sometimes simply black on white or black on brown on white in three distinct planes. 2. His blacks and whites have the depth and luminosity of full-bodied colour, and he handles the paint itself with a notable sense of drama. The ridges in the white pigment where one smear of the palette knife edges up to another, give

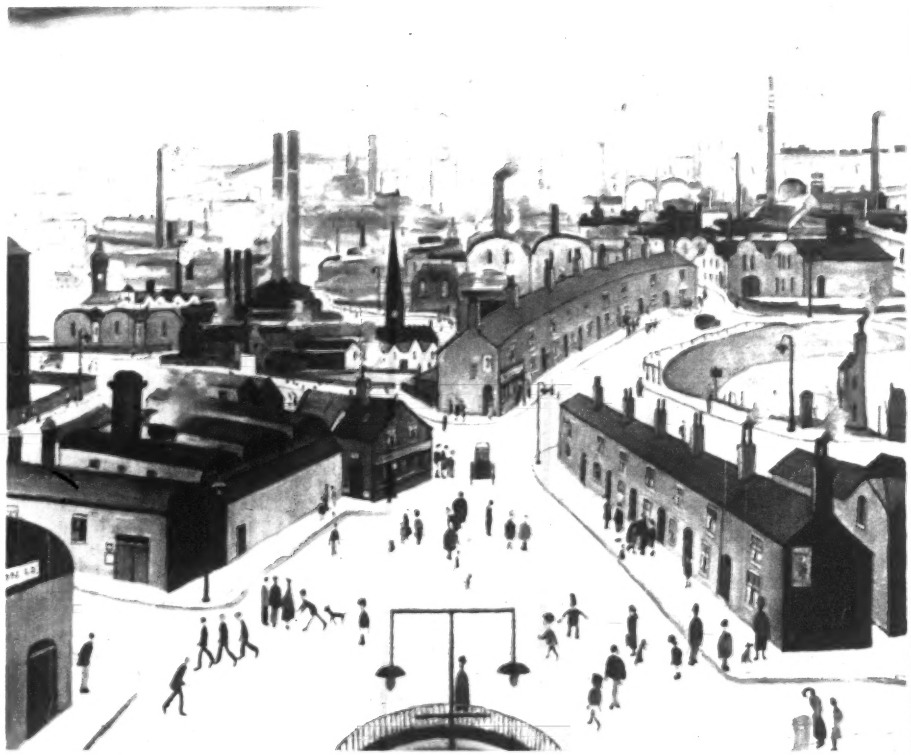
the impression that they are caused by the movement of the brown smears which have caught up some of the white on their edges, as if they were travelling across snow. The black smears that freely, just above the brown ones, never catching up any of the brown pigment on their edges. There's something in the large, slow rhythms of these paintings that forgets the towns we live in, and establishes a remote connection with nature.

In a way, there's something suggestive of a short poem about nature in the curious painting by Victor Pasmore entitled 'Abstract in Crimson, Peacock and Lilac,' 3, which was included in his exhibition at the O'Hana Gallery. The exhibition also contained some elegant examples of his rectangular constructions in wood and plastic, and a number of paintings which are nearer to geometry than the one reproduced, and nearer to drawing than to painting, since they are arrangements of



straight lines and arcs on large boards with elaborately prepared white grounds. The lines and arcs are, however, in free hand, so the arcs have a very faint tendency to wriggle and the straight lines could just conceivably be on the point of referring to something – to a twig, say, or a personal pronoun. The signs that this distinguished hand is thawing out again are even more obvious in 'Abstract in Crimson, Peacock and Lilac,' and the title itself not only indicates the predominant, if sparingly used, colours, but emphasizes their organic connections. The bright shaky marks on the big white board (it will be noted that they are almost on the point of turning into funny faces) suggest that Pasmore is taking Klee as his teacher again and that he is eager to warm himself in Klee's little power-house. But I don't think we should be over-optimistic about these signs. He probably found it painful and rather disgusting to put so many coloured marks on one white board, and it would be wrong of us to give him the impression that we would like him to suffer unduly.

L. S. Lowry has once again presented at the Lefevre Gallery a choice selection of his views of the Industrial North, and there are no significant changes. His panoramic views retain their fascination, 4, and are a continual reminder that the contemporary eye finds discursive information acceptable only if it is rendered in a

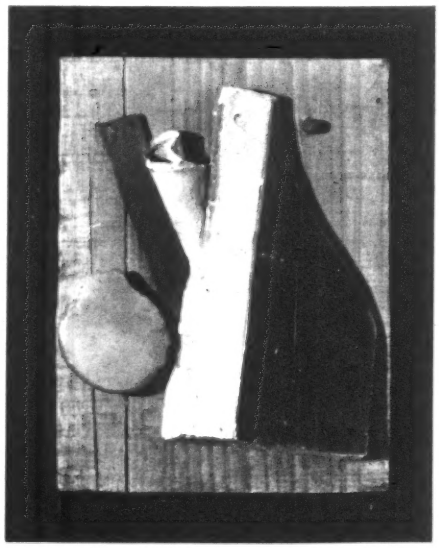


4

primitivist or quasi-innocent style. But I must admit that I have always been troubled by the sudden mist that overtakes the top band of his otherwise brightly coloured prospects, and I am sure that a true primitive would ignore the smoke altogether and give us the final pleasure of picking our way by a clearly defined route to whichever arch of the viaduct we decided to make for.

It might have been better not to hold the John Minton memorial show; it provoked only a new set of obituaries. But no, that's not quite fair: if Michael Middleton had not been asked to contribute an introduction to the catalogue he might never have written his brilliant and moving evocation of Minton's appearance: '. . . the scarecrow figure with its loping, fevered stride, head down, chin stuck into chest, every fibre intent on getting wherever he was bound; the lantern face under the shock of hair, its extraordinary gravity in repose and its total re-creation in gaiety; the exuberant clowning into which was channelled, increasingly and defensively, a perpetual crackle of nervous energy.'

Minton's vivid presence dies more slowly than his work. Apart from the self-portrait which he painted in 1953 (it is less devastatingly 'revealing' yet somehow more truthful than the portrait of him by



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Lucian Freud) his best work seems to have been the series of drawings in which he treated Samuel Palmer's visionary landscapes as a faintly erotic, neo-romantic hide-out, and in the process only succeeded in producing a kind of arty topography. 5.

5

Lords Gallery in Wellington Road, N.W.8, has just exhibited the largest group of works by the German artist Kurt Schwitters that has ever been seen in London. Schwitters was one of the outstanding Dada figures of the first half of the nineteen-twenties, and he went on being resolutely Dada after the movement had come to a natural end. But the Dada element in his work declined to a mildly humorous choice of materials for what in essence became a charming contribution to the constructivist movement. The exhibition included a few powerful and intransigent rubbish-reliefs and I would have liked to reproduce here the one which has a broken wheel as its chief motif and whose bent and rusty spokes claw at the air like a sardonic forecast of English metal sculpture, but I can only show a relief made in 1942, 6, during Schwitters's own English period, which is composed of carefully chosen junk artistically coloured and arranged.'

When Picasso repainted one side of 'Les Demoiselles d'Avignon' to put it savagely off balance he changed the course of European art. That was in 1907. Since then, painting and sculpture have become arts of assault, and the successful work is a disruptive event. But it was not until the early twenties, when Picasso himself had temporarily lost his nerve and was lending his genius to a neo-classical revival, that this approach to art was given the support of an adequate verbal concept. It came in the form of an exhortation to surrealists, and appeared in an essay by André Breton called 'Beauty will be Convulsive.' He declared that the painter ought to concern himself with 'beauty envisaged exclusively for passionate ends,' and that a truly contemporary painting should produce in the onlooker a state of physical disturbance indistinguishable from erotic pleasure.

It was probably a tactical error on Breton's part to mention erotic pleasure, for the surrealist painters spent far too much of their time grubbing about in the shadow of the 'divine Marquis.' The large group of surrealist paintings from the Urvater collection which was recently exhibited at the Tate did not include any first-rate examples of surrealism's invaluable experiments with automatic techniques, but it was fairly rich in sadistic melodrama and provided a good cross-section of the more comically solemn ways in which the surrealists devoted themselves to the search for convulsive beauty. Miro's 'Two Women,' 7, is a successful assault on the canvas, conducted with line and colour of equal violence; but in his best works the female personages are not so intent on interfering with one another and are happily scattered among the birds and stars. Ernst and Tanguy were represented by imaginary landscapes which suggest that their search had taken them, like princes in fairy tales, on long and hazardous journeys. The large and ambitious paint-

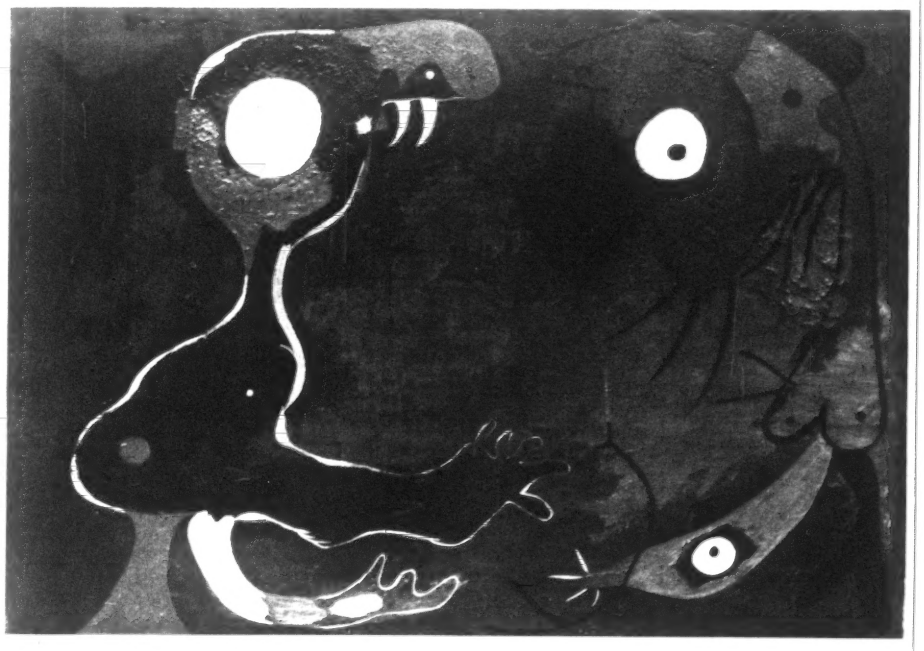
ings by Matta and Lam show them to be lightweight linearists with a flair for depicting scenes of ambiguous ferocity. The Matta reproduced here, 8, is called 'Beside Themselves.' The Magrittes maintained a high level of macabre humour. One of them was a painting of a crumbling brick tower which had grown a tangle of thick roots; it was depicted meticulously against a plain background, as if it were a botanical specimen, and as an image of an uprooted folly presented the show with a badge which it scarcely deserved.

After having one's first sight of a Jackson Pollock drip-painting in the rather narrow gallery of the Institute of Contemporary Arts, where one received the

urious and exciting impression that it ad no limits, it was something of a shock o see a number of them at Whitechapel nd be able to stand back and look at em as if they were easel paintings. Whitechapel didn't exactly diminish them, at it disclosed their double identity. At ose quarters they are marvellously inense and alert, but as soon as one stands ack they become quiet and charming wall reatments. In his handsome and fascinating retrospective, the works which preceded the drip paintings were either scenes of violence, like the coloured drawing called 'War,' 10, or undisguised assaults upon some of the aspects of contemporary form that interested him, 9, and Sam Hunter points out in his excellent introduction to the catalogue that they were influenced by the 'automatism' and the attitudes of revolt and 'sacred disorder' propounded by the surrealists who were living in New York during the war years.

The drip paintings still seem to me to be Pollock's most remarkable contribution to contemporary art, and the effect he achieved in this manner cannot be reproduced by brushwork. The last paintings in the show were done with a brush and created a rather saddening effect of anxiety and anti-climax. Perhaps he had an uneasy feeling that he still had to prove that he could paint 'properly,' but he didn't really need to prove anything: when he dripped Duco out of a can on to a huge canvas he became a master of labyrinthine line. His triumph as a painter is inherent in his fantastic control of poured paint.

Robert Melville



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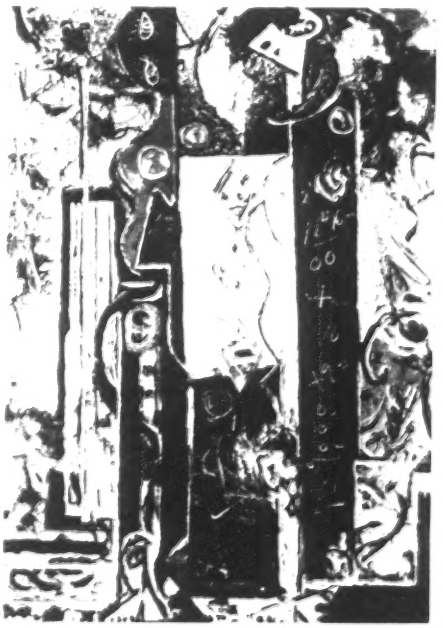

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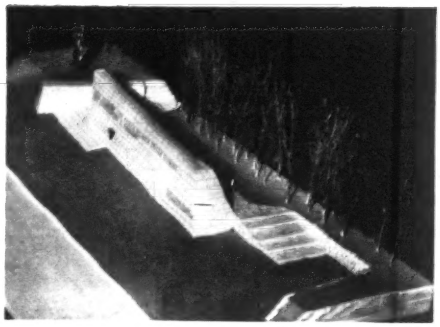
WORLD

ITALIAN PRISONERS OF WAR MEMORIAL

It was a double homage to Mario Labò when he was asked to design the memorial to those who had been killed at the ghastly Concentration Camp of Mauthausen in Austria.

Mario Labò Papà Labò is nearly seventy-five years old. He is an architect of repute, a distinguished historian of art and architecture and one of the first in Italy to have taken an interest in the modern style of architecture. His son Giorgio was a talented young architect and a friend of architects. He was a fighter in the Resistance, was arrested by the Nazis, ill treated and finally shot.

The design is an exemplar of how an immeasurably delicate task can be fulfilled. It has neither the facile gentility of so many English war memorials nor the all-too-un-facile abstraction of Reg Butler's Unknown Political Prisoner. The composition, 1, is simple, perhaps bleak: a wall of granite with a strong batter, a wailing wall, as it has been described, and steps about the wall, hauntingly senseless and aimless; an inscription in large, unmonumental letters and another small, near the first, which reads: *Beati qui persecutionem patiuntur propter justitiam*, 2; finally to the left, Mirko Basadella's cross, illustrated on page 86 of this issue. Mirko won a second prize in the competition for the monument to the unknown political prisoner and first prize for



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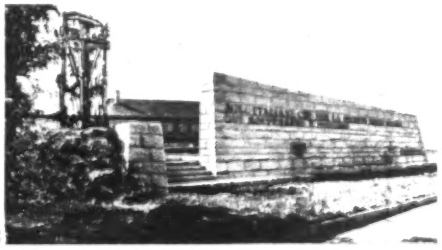
sculpture at Sao Paulo in 1955. The Mauthausen cross is of forged iron, about ten feet high it seems higher. It rises, at first hardly perceived, in a thicket of thorns. It is both concrete and abstract, and perhaps it succeeded in being both, because of the desolate mood of the site. Where Reg Butler had to evoke suffering in general, in many places and for many causes, here for Mirko was the place where thousands had perished for one cause, among them, it may be added in the ARCHITECTURAL REVIEW, Giuseppe Pagano, the intellectual leader of the modern



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movement in Italy, and Gianluigi Banfi, the first of the two Bs in BBPR. So this is a monument to the known, not the unknown, and a memorial that will for long have to stand up to the fierce emotions of those relatives who visit Mauthausen. The cross is still our most appropriate symbol of suffering, the spikes are an immediately convincing symbol of torture. With that much guidance the monument will at once be understood and for ever remembered. The deliberate, ascetic absence of such guidance from Reg Butler's monument both in its original form and its present form ready for erection in Berlin is what caused the opposition against it.

Nikolaus Pevsner

JACOBSEN

More than any other Danish architect, Arne Jacobsen (the subject of an exhibition now at the RIBA) is able to express in his works the technical and architectural possibilities of his time.

He graduated from the Royal Academy, Copenhagen, in 1927 and two years later he and the architect Flemming Lassen carried out a work destined to have a significant influence on architectural thought; the circular *House of the Future*, 1, functional and flat roofed, exhibited in Copenhagen in 1929. This kind of architecture had not been seen in Denmark at that time, and caused a great stir. Other young Danish architects were also becoming interested in Bauhaus ideas at the time and were reacting against Neo-classicism. Freed from the strict rules of classicism, Jacobsen was able, in his developments at Bellevue in the early thirties, to shape his buildings to make the most of all the features of the site, and to enable the greatest possible number of flats to share the attractive view of the Sound.

His ability to perceive and create a 'milieu' was put to a severe test in 1937 when he was called upon to design the Stelling office-building in an old part of Copenhagen, and decided to design a building of truly contemporary style which complied with all the functional requirements, 2. The result came in for a good deal of criticism on the part of the public. The architects, on the other hand, were delighted, and the Stelling Building is quoted as an example, when schemes for the renewal of the old town give rise to discussions on principles.

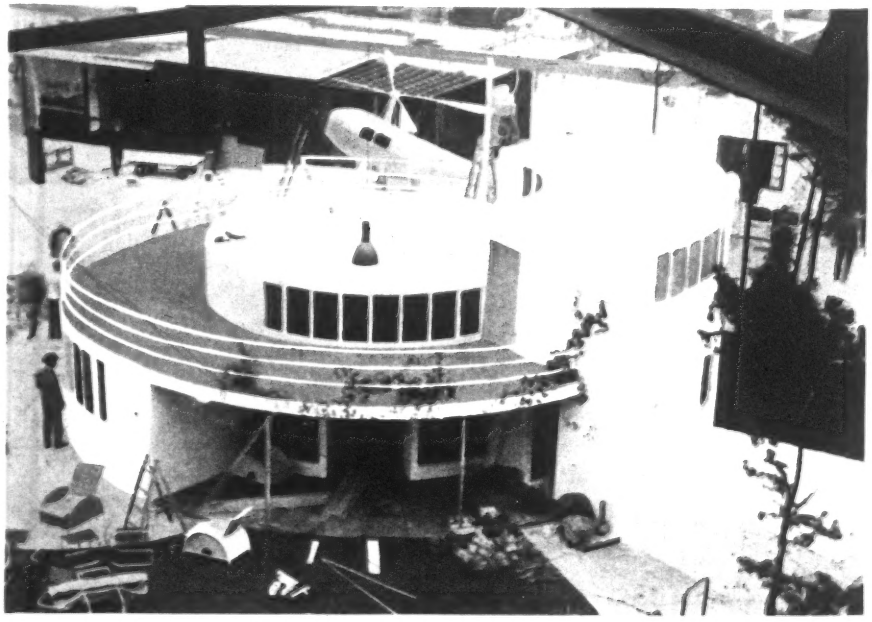
Arne Jacobsen's well-known town-hall at Aarhus (in collaboration with Eric Møller) was also heavily criticized. Here he was forced by public opinion to give the building a tower.

On the other hand, Søllerød town-hall (in collaboration with Flemming Lassen) immediately became a popular building and, favoured by particularly attractive

2

surroundings, it is most frequently referred to as a characteristic work by Jacobsen. His studies in housing were interrupted by the war, but his Soholm estate at Klampenborg, completed in 1950, with the marked sculptural effect of the rhythm of its gables, caused a stir far beyond the frontiers of Denmark.

By that time since 1933 in fact the Bauhaus ideals had taken refuge in the United States, whose hospitality had enabled them to develop further. When Denmark was liberated, and when it became possible to build again in reinforced concrete, steel and glass, Jacobsen was able to retrace the Bauhaus ideal in the



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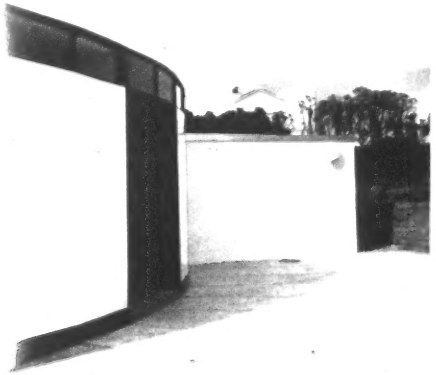
USA, alive and artistically treated. It was necessary for him to hold these building-shapes in his hands, as it were, to feel them and recognize them as a medium for his own artistic development. His ability to renew himself, to vary his means of artistic expression, has been interpreted by some critics as a lack of a personal artistic note. But Rodovre town hall and the SAS building are not reproductions of American buildings. In the choice of proportions, details and materials they like the Jespersen building in Copenhagen, 6 represent typical works of Arne Jacobsen.

In Rodovre Town Hall, 3, built in 1955, the offices are concentrated in a utilitarian

3

building, a cube where the module, governed by functional considerations, is apparent in the facade-partition, as well as inside. The air terminal and hotel, respectively housed in a large horizontal and mighty vertical block, 5, of the SAS building, his latest work, jointly form a building full of contrast. Again we find the simplification of architectural expression until a strong sculptural effect is achieved, as also in the circular villa near his earlier fish-smoking house at Odden, 4.

The main structure of the building, the



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Arne Jacobsen's use of curtain walling. 5, above, the projected SAS air terminal. 6, below, the Jespersen building, a small office block in Copenhagen.

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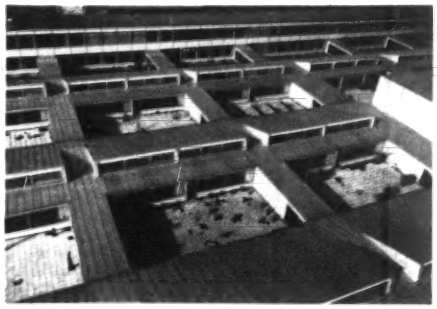

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choice of proportions and the refinement of detail are increasingly cultivated by him in his constant search for simplification and refinement of form. This is as true of recent buildings like the Munkegars school at Gentofte, 7, with its rational courtyard plan, as of the excellent furniture, lamps, furnishing fabrics and other products of applied art he designs. These last are frequently created by him in conjunction with some building task. We can look forward to many new works by his hand; Arne Jacobsen is only 56.

Paul Erik Shriver

TOWNSCAPE

HANDRAILS FOR LINE

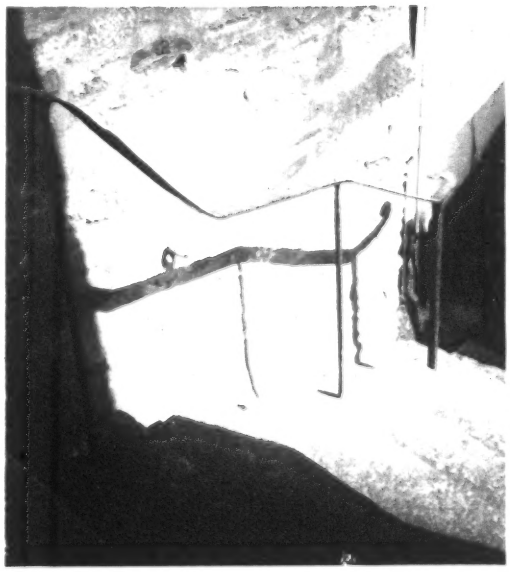
The four aspects of the outdoor scene with which the visual planner has to concern himself are space, mass, texture, and line. The last of these, line, is divisible into several categories.

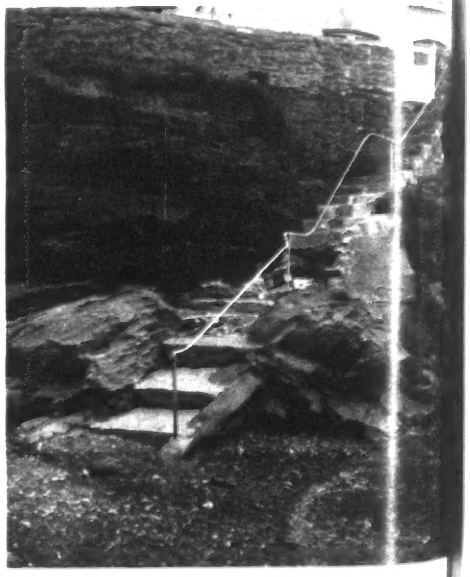
The line formed by the earth or the objects upon it against the sky, the skyline, is one; the line formed by the meeting of two surfaces is another. These are ubiquitous, but there is another kind of line which is rarer: the free calligraphic line scrawled across the surface of the picture.

Here are four examples of this third kind; in each the line is the line of a handrail. In the first (Ross-on-Wye) the handrail is attached to a wall, in the second and third (Ross again and Fowey) it is equally close to a wall, but has its own supports; in all three the essential character of the wall, its solidity and its function as a plane bounding space, is emphasized by the rail, which also gives the eye a sense of direction. In the fourth photograph (Fowey again) there is no wall but the rail itself creates, with the most economical means possible, a spatial division, while leading the eye a pretty dance into the bargain.

'Leading the eye a pretty dance . . .': that is the purpose, aesthetically speaking, of pure line. As these photographs show, there need be no conflict between the aesthetic purpose of a handrail, considered as line, and the utilitarian purpose of a handrail, considered as a handrail. Hence its peculiar value, as a linear element, in the designer's stock of motifs.

Andrew Hammer





1 and 2, *Ross-on-Wye, Herefordshire*
3 and 4, *Fowey, Cornwall*

1 | 2
3 | 4

BOOKS

PORTAL AND CAPITAL

SCULPTURE AT CHARTRES. *By Peter Kidson and Ursula Varicas. Toronto, 1958. 18s.*

This is a useful book and an enjoyable one as well in spite of dull layout and a rather grey tone of the photographs. The photographs are excellent—some indeed, such as the capitals from the north tower, the almost completely unknown king from the north porch, and the Christ enthroned from the Portail Royal, are unforgettable. The text is instructive and written in a straightforward style. It deals with matters of iconography foremost—what is represented, why it is represented and why it is represented thus—but does not neglect aesthetic matters. Chartres demonstrates on the highest level of European art what sculptors were capable of about 1150 and about 1205 to 1235. On the stages, especially in the latter thirty years, there is no unanimity of opinion. Although it looks indeed as though the three portals of the south transept were all built at one go, the sculpture of the side portals is almost as different from that of the middle one, as are the side portals from the middle portal in the north transept. St. Piat is nearer to St. George than he is to St. James. The suggestion that St. Launer and St. Avit were added by a man who came from Reims is at once convincing. St. Theodore on the other hand can be understood without any impulse from outside the Chartres workshop. One of the most attractive

features of the book is the illustration of details from the brackets and pedestals of figures. The relations with Villard de Honnecourt's famous textbook are illuminating and have not been stressed before.

N.P.

ELEMENTARIST

THE WORK OF G. RIETVELD ARCHITECT. *By Theodoor M. Brown. Bruna (Utrecht), price in England, 3s.6d.*

Gerrit Thomas Rietveld is a Dutch provincial artist who has twice made contributions of unmistakable international importance to the growth of mainstream modern design. These were the so-called 'Red-Blue' chair of 1918 and the Schröder House, in the suburbs of Utrecht, of 1924. Both are typical of that species of space-composition that may loosely be termed Elementarist' though this term did not exist at the time the chair was designed, and had been twisted to mean something else before the house was a year old. Nevertheless, it is the Elementarist connection that gives these designs their international significance, and it is in this connection that Mr. Brown's book (a Utrecht doctorate thesis hustled into print for its subject's seventieth birthday) is conspicuously weak. Mr. Brown appears to accept a little too willingly the official *de Stijl* estimate, propagated by Theo van Doesburg, that Rietveld was a native Dutch genius who profoundly influenced the course of modern German architecture.

That there was influence is unarguable, that Rietveld was an architect gifted with occasional flashes of dazzling originality there is no doubt, but there is more to it than that. The chair was conceived in a culture cut off from the outside world by Holland's neutrality but it could never have been produced without the successive waves of Wrightian influence to which Dutch designers had been subjected, nor without the English Arts and Crafts tradition, for its basic form is that of a Morris Chair. But to these given influences had been added a searching, abstract, *ad hoc* analysis, which is peculiar to the time and place, can be recognized in Mondriaan, and was identified by J. J. P. Oud as anti-Wrightian.

The Schröder House is different. Where the chair analyses down to essentials and results in a rational tracery in space, the house elaborates outwards from a simple interior plan, and the necessary extensions and openings of the outer wall have been made the excuse for the creation of kind of habitable bas-sculpture of horizontals and verticals. Between the two one may interpolate another chair, in which the elegant rationalism of the Red-Blue has been sacrificed to an arty and non-functional asymmetry—it appears to have been designed for a one-armed man. This chair Mr. Brown calls the 'Berlin,' on the grounds that it was designed for exhibition in that city in 1923, but the significance of both time and place seem to escape him.

Van Doesburg's contacts with Berlin had, by 1922, converted him and *de Stijl* magazine from a transmitter of Dutch ideas to the world, into a transmitter of Berlin ideas—the ideas of the *G* group, of which Elementarism was the creed and El Lissitsky the moving spirit. The Schröder House was the first permanent realization of these outward-going ideas, but it was not the only realization of them in 1924. Mr. Brown seems unaware that Frederik Kiesler's spatially more advanced *Cité dans l'Espace* was only *re*-created for the Paris exhibition of 1925, and had first been erected in the same year as the Schröder House. He seems equally unaware that this, and Rietveld's Berlin chair, and Kiesler's *Cité* all appear to be indebted to some earlier exhibition designs of Lissitsky's.

When these considerations are read into the record, much of Rietveld's supposed influence evaporates—he and, for instance, Mies van der Rohe appear as designers drawing on a common pool of ideas, and primacy in the use of a particular architectural device does not necessarily imply primacy in its conception. The adoption of a purely Doesburgian attitude to the history of abstract art is thus a serious blemish on the book, but it does not make it a useless or a trivial one. Within the distorted diagram of history that Mr. Brown has accepted, he has done a great deal of valuable research and recorded much from the architect's memories and papers that was not available in print before, including a letter from van Doesburg that makes his historical slant transparently obvious. It is, to sum up, a book that the student of modern movement history should read with provisos, but it is also a book that he should read.

Reyner Banham

THE GREEKS FROM GHANA

GREEK ARCHITECTURE. *By A. W. Lawrence. The Pelican History of Art. 63s.*

The English-reading student of Greek architecture has not lacked for good textbooks on his subject. New editions of Dinsmoor's and Robertson's manuals with up-to-date bibliographies have been issued in recent years, and between them they cover more than adequately the history of the art of building in antiquity. Nevertheless, there was room for another book, which should expand sections which the earlier books had treated briefly, and give a fresh slant on periods which, for whatever reason, they had tended to regard as qualitatively of less importance. Lawrence has provided just such a book, and has done it very well. It has certain obvious merits which should be recorded immediately. It devotes much more space than either Dinsmoor or Robertson to the origins and early history of Greek architecture; and this is only fair, since the whole history of Mycenaean and archaic Greece itself has been transformed in recent years by the epigraphic discoveries of Ventris and others. It deals very fully with Greek domestic architecture, town-planning, halls and open structures. And it makes a special point of Greek fortifications, a subject on which Lawrence is the first authority. On the other hand, it gives a fresh and subtly reasoned account of the central theme of any general history of Greek architecture the evolution of the Greek temple and the development of the Doric style. All this can be commended unreservedly to the general student of architectural history.

To the general reader and the Pelican History of Art is addressed to such the most suggestive chapter will be the Epilogue, in which Lawrence allows himself to make a qualitative aesthetic evaluation of Greek architecture; and it is here that the general reader will feel entitled to ask questions, and perhaps even to raise objections. Lawrence starts with an unusual advantage over all his competitors: for some years he was Professor of Archaeology at the University College of Ghana; and he can therefore make a significant contribution from the vantage-point of Accra. 'After some years' personal experience of a society which is now emerging from a primitive culture, I picture the Greeks as more alien than I used to think them, and far more vividly' such is the privileged position from which Lawrence sets out; and the freshness and independence of many of his judgments are certainly due as much to this unaccustomed angle of vision as to that native ingenuity which readers of his earlier works, written in the less exciting atmosphere of Oxford and Cambridge, have long since admired. Lawrence's approach to his problem is suitably cautious: it requires, he reminds us, 'a strenuous intellectual effort to form an appreciative judgment of Greek architecture

every building is to some extent ruined . . . the very fact of disuse effects a transformation of its own, making an academic exercise in design out of what used to be a place of worship or of living. . . . But the best-trained imagination has its limitations . . . the spiritual gulf between the ancient and the modern worlds is broader than is generally realized. The Greeks, when their architecture reached its height, had only lately ceased to be a semi-primitive people.' And he uses this fact to explain that curious mixture of extreme sophistication and vestigial conservatism which characterizes the architecture of the classical period, that disconcerting combination of perfectionism in detail with an almost infantile timidity of structural design. Up to a point, Lawrence faces this dilemma squarely: 'The Doric temple that supreme creation of Periclean Athens is really abstract sculpture; regarded from the standpoint of utility as a building, the temple is ridiculous.'

It is at this point that the general reader grows restive. *Was* the Parthenon the supreme creation of Periclean Athens? We know next to nothing of Phidias, and little enough of Sophocles we cannot be sure. And, *has* architecture the right to be abstract sculpture? And why should we *not* judge a temple 'from the standpoint of utility'? There is nothing ridiculous about Ayia Sofia or Chartres; they are completely successful functionally, and 'supreme creations' into the bargain. And again, why is it that the unresolved discord of the primitive and the civilized in the Athenian consciousness of the Periclean age should hamper the growth of architecture, but not the growth of sculpture or (we may reasonably guess) painting or poetry or prose? And when Lawrence says, a little further on,

'there can be no doubt that arches were considered an aesthetically reprehensible substitute for the flat lintel, with which was associated everything of recognized beauty in architecture . . ..' we can only ask again: *why?* And all Lawrence can say in reply is: 'Beauty implied something analogous to what we call the right thing; a building could not be beautiful unless it conformed with the long-established and universally-admitted dogmas of the art, as well as having – and this ranked above all other qualities – correct proportions to the smallest detail. In actual fact, the greatest masterpiece of ancient Greece, the Parthenon, is the one building in the world which may be assessed as absolutely right.'

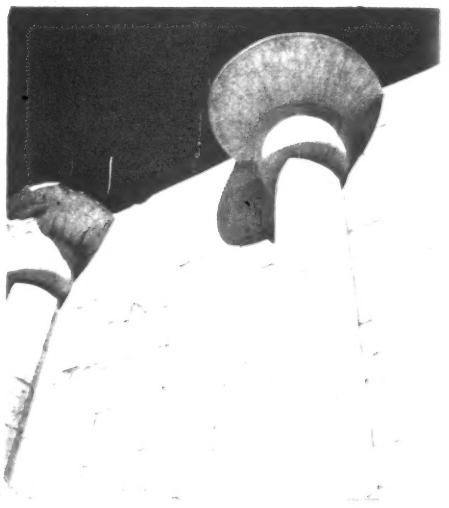
This is the last sentence in the book; and the general reader may pause to wonder. The right thing . . . long-established and universally-admitted dogmas . . . correct proportions . . . the one building in the world which may be assessed as absolutely right. . . . The experience of Ghana seems to have evaporated and the philhellene conventionality of Oxford and Cambridge seems to have re-asserted itself. It is disappointing, because Lawrence is one of the few critics of ancient art who might have offered an explanation of that central oddity – the fact that Greek architecture was so conservative and atrophied so early while Greek sculpture and (for all we know) Greek painting went on from strength to strength, from one brilliant innovation to another.

Roger Hinks

Shorter Notices

THE THRONES OF EARTH AND HEAVEN. *By Rol ff Beny, with an introduction by Herbert Read, and texts by Freya Stark, Bernard Berenson, Jean Cocteau, Rose Macaulay and Stephen Spender. Thames and Hudson, 4gns.*

Mr. Beny is a young Canadian painter, given to photographing what he decides not to paint. His publishers have made a stunning book out of the results, but the photographs themselves present, as might be expected from a painter, a slightly arty quality that is out of step with the documentary turn that photography has taken under the influence of the *Time* and *Magnum* schools. That is to say, the resultant images do not arise more or less directly from the subject-event in interaction with the mechanics of the photographic process, but appear to be photographic reproductions of images preconceived in terms of an aesthetic, painterly sensibility.



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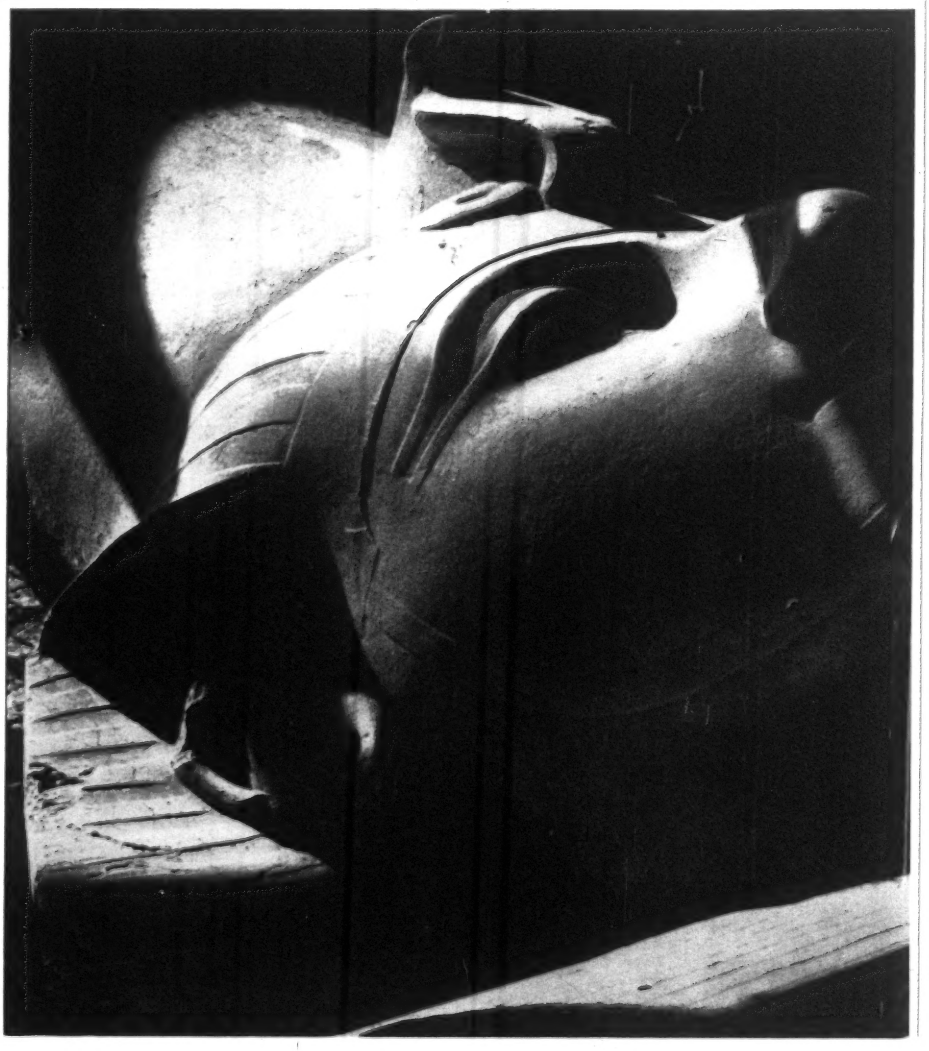
What emerges is therefore less an evocation of the Mediterranean scene than of the personality of a grand-tourist making an impossibly grand tour, its visual range limited by the limitations of the tourist's Baedecker-guided mind. In some cases, the supporting texts, being the work of more mature minds than Mr. Beny's, more skilled in their own channels of communication than he in his, tell us more of the appearance of the scene than he can – Berenson in particular.

Occasionally, the subject matter, by sheer enormity or oddity, breaks through the mould of the painterly aesthetic, carries references that have by-passed the photographer, or flatly contradict him. A fallen Egyptian colossus snoozing in a grove of palms, I; a piece of ancient architecture reduced by the accidents of time to the status of a diagram in Choisy, 2; or Gaudí's *Sagrada Familia*, glaring out of the page to make nonsense of the caption's ill-considered 'a nineteenth century pseudo-gothic folly.' One senses that just as in every fat man there is a thin one fighting to get out, there may be in this painter a photographer fighting to get out, but not fighting hard enough.

Michel Santiago



1

Books Received

A PLACE IN THE FOREST. By The Earl of Bessborough. B. T. Batsford Ltd. 10s. 6d.

KENSINGTON. By William Gaunt. B. T. Batsford Ltd. 25s.

FLOORS AND FLOORING. By D. M. J. Davidson. Crosby Lockwood & Son Ltd. 12s. 6d.

THE PERSPECTIVIST. By R. Myerscough-Walker. Sir Isaac Pitman & Sons. 60s.

REINFORCED CONCRETE IN ARCHITECTURE. By Ali Ahmed Raafat. Reinhold Publishing Corp., New York. Chapman & Hall, England. 120s.

THE WEATHER CONDITIONED HOUSE. By Groff Conklin. Reinhold Publishing Corp., New York. Chapman & Hall, England. 118s.

WOHNHOCKHAUSER—POINT BLOCKS. By Paulhans Peter. Georg D. W. Callwey, Munich. Dm. 17.50.

DECORATIVE ART. Vol. 48. 1958-59. The Studio Ltd. 35s.

ALUMINIUM IN MODERN ARCHITECTURE. 1958. Reynolds Metal Company. Reinhold Publishing Corp., New York. Chapman & Hall, England. 40s.

THE TEACHING OF SCIENCE IN SECONDARY SCHOOLS. Compiled by a Joint Committee of the Incorporated Association of Assistant Masters and The Science Masters' Association. John Murray Ltd. 17s. 6d.

MATERIALS AND METHODS OF ARCHITECTURAL CONSTRUCTION. 3rd Edition. H. Parker, C. H. Gay and J. W. MacGuire. John Wiley & Sons, New York. Chapman & Hall, England. 96s.

THE THEATRE. Helen & Richard Leacroft. Methuen & Co. Ltd. 10s. 6d.

MODULOR 2. Le Corbusier. Faber & Faber. 42s.

SKILL

WHOLE HOUSE HEATING

by John Voelcker

Whether he likes it or not, the turn of technical events has involved the architect in the problem of heating as never before. Up to a very few years ago he could design a space and a structure and then think how to heat it; but now he knows that the space and the structure are as significant in determining the comfort produced as the actual equipment chosen. It seems logical, therefore, to preface this account of equipment for whole house heating by certain general considerations which bear on the providing of comfort economically and on the interrelation between heat source and structure.

Architects have been aware for some time that heating economy is closely bound up with the limiting of heat loss through the walls and through too much ventilation. They are perhaps less aware of the extent to which it depends on the idea of intermittency, on the speed with which a building will heat up and with which the heat source will shut down. Intermittency is more important than it used to be, partly because we leave our houses empty for longer periods during the day and partly because we are accustomed to use more expensive, more refined fuels. Also it has become more of an issue that these fuels and the equipment used to burn them are more susceptible to control than before and because the great development which has taken place in recent years in materials of low thermal capacity makes it easier to construct buildings which can respond quickly to temperature change.

It is a part of our traditional knowledge that the use of certain materials of low thermal capacity (wood used as panelling) make for comfort; but this traditional knowledge has been very imperfectly carried over into modern practice since we have been insufficiently aware of the corollary, namely, that if certain materials of high thermal capacity and high thermal transmittance are used to line the walls of a room, comfort can be impossible to provide. It was shown by Thomas Bedford many years ago that the average temperature of the walls (and of solids within a room) should not be appreciably lower than that of the air, but should preferably be higher. Later authority also showed that the air temperature should be kept figure round 65 F. The average radiant temperature of the is determined by a formula* which takes into account the internal temperature, the difference between this and that of the outside air, internal resistance of the surface and the total air to air resistance of the wall. The internal temperature of any given wall will always be lower than that of the internal air (unless it is heated); and if the total resistance is low, it will be much lower. As an example, with an inside air temperature of 65 F and an outside air temperature of 32 F, an 11-in. cavity brick wall will have an inside surface temperature of 50.2 F. To provide tolerable (but hardly comfortable conditions) with such a wall, it would be necessary to raise the air temperature to 75 F. Alternatively, you could raise the average mean radiant temperatures of the other surfaces within the room by some form of panel heating. This may not be practicable, however, and in any case a heating 'problem' has been created which another choice of walling could have avoided.

In recent years our notions of whole house heating have been much influenced by two contrasting technical developments on the equipment side: electrical thermal storage and the adaptation for the small house of the warm air forced-draught system. But before considering the very diverse heating service which these give, more must be said about the house itself. It is clear that the highly insulated house is a different proposition thermally to the house of tradition in that a greater share of the heat generated in one part of the house infiltrates into other parts. This discovery was one of the great surprises of the BRS Abbots Langley experiment after the war. The houses which were the subject of this experiment had a 'house U value' of only about 0.38, which is about the standard implied by the proposed by-e-law regulations; also they were of traditional cellular plan. Even so, it was found that for every 1 F put into the living room 0.5 F filtered to the bedroom above. This effect is presumably increased when the open plan is adopted for the ground floor. Apart from this consideration of heat filtering through the structure, there is now evidence on the interreflection of heated surfaces which favours the open as against the cellular plan. Hallett in 'Notes on the Theory of Radiant Heating' (Institute Heating and Ventilating Engineers, 29, 206) describes how a room 80 ft. by 20 ft. warmed by medium temperature ceiling panels was divided into two parts, one 60 ft. by 20 ft. and the other 20 ft. by 20 ft., by a partition. It was observed that the larger part was cooler than the whole room before division and that the smaller part was uncomfortably cooler, despite the fact that the same total quantity of heat was provided and the heat supplied per unit area was the same in both parts. This observation indicates that increases in the area of a room heated by floor or ceiling panels increases the heating effect on the occupants, not only because the radiation from distant panels adds appreciably to the radiation received from panels near to the occupants, but also because the radiation from panels not directly above or beneath the occupants strikes a larger surface of the occupants.

Both warm air and underfloor have their limitations and both make specific demands on the structure. Warm air is the heating method par excellence for intermittent heating; but because it warms the air and not the structure it can never, by itself, produce those ideal conditions of comfort laid down by Dr. Bedford; and it will get tolerably near to them only if the wall and floor surfaces are capable of warming up quickly and of reaching a temperature only a few degrees lower than that of the air. There is no doubt that such surfaces as the traditional plastered wall and the solid ground floor with a thin covering of thermoplastic or PVC are unsatisfactory, as they fail on both of these counts and force the occupants of a room to adopt an air temperature which will have to be so high to give a feeling of warmth that it will also give a feeling of stuffiness.

The main limitations of underfloor heating are slow response to control and the difficulty of providing a large enough area to heat the room in very cold weather. At the same time, precautions must be taken to limit the loss of heat round the perimeter.

In reviewing the present range of equipment suitable for whole house heating, we have decided to limit 'equipment' to that concerned with distribution, as distinct from heat production; for to do otherwise would have drawn in almost every gas, electric or solid fuel boiler on the market. Even with this restricted definition it is not easy to find a logical basis for categorizing heating equipment. Lacking this, it seems sensible to start with the traditional media for whole house heating: hot water radiators; and to pass from these to the rationalized equipment for water borne heating, i.e., panels and skirting heating; and to conclude with electric panels and warm air convectors. It must be emphasized that this is no more than a commentary on the more interesting pieces of equipment that we have been able to find and is not in any way a comprehensive review of the field.

radiators

Radiators, the traditional type of whole house heating equipment in the era when it was a luxury, have undergone considerable modifications of recent years. The most revolutionary development, the introduction of the small pipe system, has, of course, nothing to do with the form of the radiator itself but must be mentioned here as it has freed all hot water heating systems from the desperate limitations imposed by gravity circulation: it is now possible to put your heating units where they are needed to warm people, and not merely where they are needed to maintain the flow of water.

Apart from this, radiators have themselves evolved considerably to conform to the findings of heating research, an evolution which is illustrated in 1, 2, 3 and 4. Not all radiators have responded, however, and it is of some importance to architects to know the enlightened view. There are three points to notice. The first is that the material of the radiator should be capable of a quick thermal response. This tells in favour of the light weight radiator (e.g. pressed steel) over traditional cast iron. The second concerns the actual configuration of the heating surface. It was the belief of early radiator designers that the more knobbly the radiator, the better. It is now known that radiators with re-entrant surfaces give less output than those with flat surfaces, since with the latter much of the radiant heat is merely re-absorbed by the radiator. The third point concerns the adaptation of the form of the radiator to enable it to be put where it will be most useful. This has led to the development of the long low radiator in place of the tall column, and thence to the skirting heater and, indeed, to underfloor heating. Radiators should not be enclosed or painted with metallic paint. They should be backed with walls of low thermal capacity and high thermal resistance and, if possible, the surface behind them should be lined with metal foil.

skirting heating

Observations on the thermal characteristics of conventional radiators have led to the development of heating equipment which provides improved heat distribution. One such development is 'Baseboard' or skirting heating which exploits the convection characteristics of conventional radiators by applying warm air at very low level, evenly distributed round the perimeter of an enclosure. Illustrations 5 and 6 show two ranges of skirting heaters now on the market. The first is that of Crane Limited who were the first in the field in this country. The Crane skirting heaters are of cast iron and are made in three models: 6-in. and 9-in. skirtings which are radiant only and a 9-in. skirting which is both radiant and convective. The second range is Copperad Limited's Wall-strip, 6, which is likewise made in

* An article on this subject by the late A. Bramley-Moore appeared in the *Journal* by Alexander Hardy, 1950 and November 27, 1953.

three models: one which is primarily radiant, another which is primarily convective, and a third which is both. Of these the convective version has by far the greatest heat emission in terms of Btus, giving (with water at 150 F) 370 Btu per foot run against 240 Btu per foot run for the combined strip and 158 Btu per foot run for the radiant strip. These emission rates (which are comparable for the Crane skirtings) can be stepped up by raising the temperature of the water (Crane advise 170 F for forced circulation); nevertheless they are not large and the run of uninterrupted skirting space will have to be considerable if 'Baseboard' units are used to provide all the heat required. Normally it will be advisable to used forced circulation by installing a pump in the boiler return because this will increase the emissions and ensure that the same temperature is maintained in every part of the circuit. The convector or combined 'Baseboard' units are to be preferred to the radiant types for domestic use, not only because the larger quantity of heat emitted will probably be required, but also because skirting level, the ideal position for releasing warm air, is not the best place for emitting radiant heat. It is suggested that 'Baseboard' heating is suitable for bedrooms where lower temperatures are required and where the ratio between the run of skirting and the volume of the room is favourable, since only the bedhead and the door need mask or interrupt the circuit.

panels

Another development from the conventional radiator is the flat faced panel which improves its radiant characteristics since there are no re-entrant surfaces. While 'Baseboard' heating requires an extensive uninterrupted perimeter, panel heating requires large surfaces unobstructed by furniture if it is to provide the quantity of heat required. Illustration 7 shows an Ideal Rayrad, manufactured by Ideal Radiators Limited. The unit consists of a number of interconnected D section waterways which can be coupled to adjacent units and fixed to the wall, floor or ceiling structure of a building. A variety of rolled steel sheets suitable for use in different positions is provided for screwing on to the face of these units. Such panels are particularly useful when the requirements of whole house heating are to be satisfied in an existing dwelling because they can provide unobtrusive warm surfaces and a good distribution of warmth. The positions in which panels are fixed will depend on the surfaces available and upon the ratio between convected and radiant heat required. For guidance, it can be assumed that the panels mounted on ceilings emit 70 per cent, on walls 65 per cent, and on floors 55 per cent of their heat as radiation. Whenever panels are used, adequate insulation should be provided to ensure that no heat is lost in the wrong direction.

In new houses where panel heating is to be used it is unnecessary to fix back panel units. Instead, the heating elements, whether hot water tubes or electric cables, are embedded in the structure and the wall surfaces themselves are heated to emit the warmth required. The equipment for panel heating is simple, but the way in which it is laid out requires careful thought because alterations are difficult and expensive once the system has been installed. The position of the panels, the size and shape of the enclosure to be heated, and the materials to be used in the construction of the panel must be considered. Because a considerable quantity of radiant heat is emitted by the panels, exact calculations are complicated and, in the case of house heating where there are numerous variables, results are probably inaccurate. Nevertheless the following observations should be borne in mind when determining the layout. Panels, whether embedded in ceilings, walls or floors, should be arranged in such a way that radiant heat is emitted as evenly as possible. At the same time the system should be zoned or graduated so that greater quantities of heat are emitted in the colder parts of an enclosure, for example, near external walls. Ceiling panels (which were described in 'Suspended Ceilings Part 2,' AR, September, 1958) have advantages which suggest that they are suitable for domestic use. The first floor structure can be designed as a heat distributor emitting a greater proportion of its heat downward and the remainder providing background heat to the first-storey rooms. Added to this, ceilings provide a surface area larger than walls or floors because they are not obstructed by furniture, but the thermal characteristics of ceiling panels must be weighed against these advantages. Ceiling panels emit a higher proportion of radiant heat than wall or floor panels and, although an even air temperature throughout a room is assured, there is some danger that radiation from a source only 8 ft. above floor level may cause discomfort to a person standing underneath. In any case the area and surface temperature of any panel system must be limited by rule of thumb, depending on the ceiling height. These characteristics indicate that ceiling panels may be used in living rooms where the occupants are normally seated at low level since the intensity of radiation is reduced as the surface areas of the ceiling occupants receiving the radiation are increased.

Wall panels are seldom used for heating because the walls are broken up by openings and their surfaces are masked by furniture. It is doubtful whether a sufficient area of heating surface could be found; and even if it could, the distribution of radiant heat would be irregular and therefore cause discomfort.

floor heating

Floor heating by hot water and electricity is used extensively; in particular, in solid ground floors. While the surface temperature of ceiling panels is usually about 100 F the surface temperature of a floor will cause discomfort if it exceeds 80 F. This indicates that the maximum floor area available must be heated and even then it is doubtful if any more than background heat will be provided. Care must be exercised in the choice of floor finishes and any adhesives used should be heat resisting and sufficiently ductile to accommodate the relative thermal movement of slab, floor and floor finish.

The construction in which panels are embedded should normally be of low thermal capacity so that the

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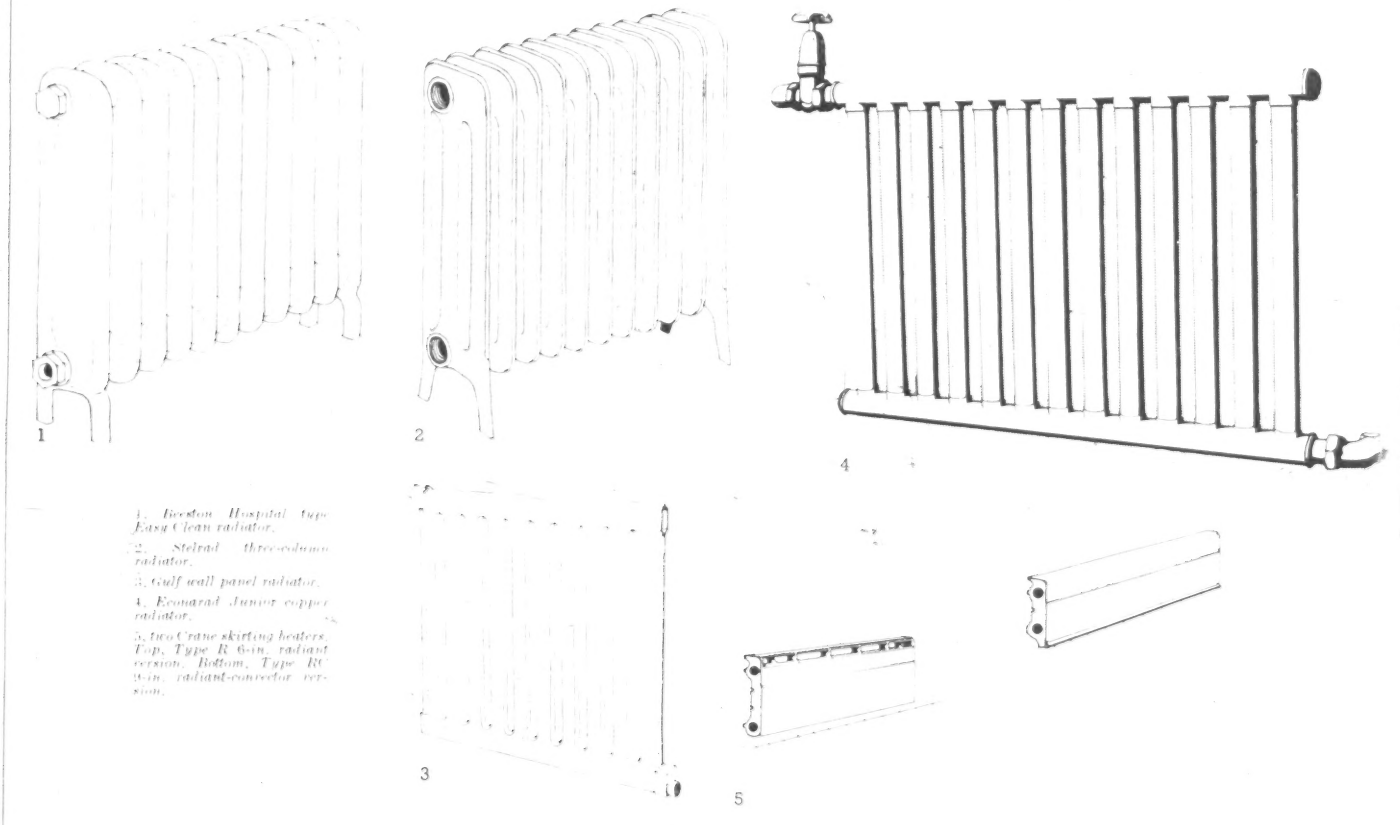
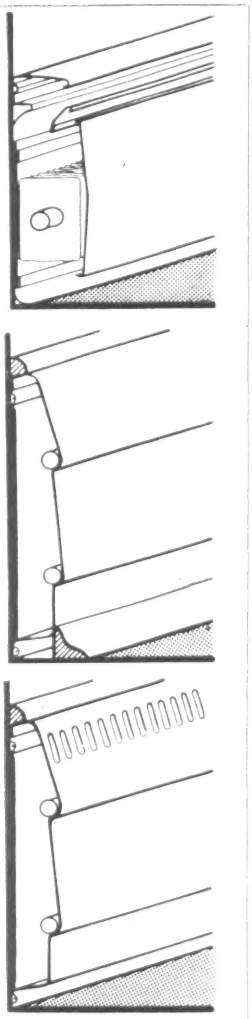


1. *Beeston Hospital type Easy Clean radiator.*
2. *Stelrad three-column radiator.*
3. *Gulf wall panel radiator.*
4. *Econorad Junior copper radiator.*
5. *two Crane skirting heaters. Top, Type R 6-in. radiant version. Bottom, Type RC 9-in. radiant-convector version.*



3, three Copperad Wallstrip heating heaters. Top, Tape C (mainly convector version. Middle, Tape B (mainly radiant version. Bottom, Tape D (radiant and convector version

overcome this and at the same time to provide for expansion in the metal. 'Panelite' pipes are covered in an insulating sheath.

Illustration 9 shows a solid floor heated by 'Panelec' electric floor warming equipment. In this example the concrete slab is used to store heat and, therefore, insulation is only provided at the edges of the sheet where heat might be lost rapidly. It will be seen that the heating cables are contained in sheaths so that they can be withdrawn in case of fault. A number of other preparatory systems are available, some having cables that can be withdrawn and others, such as the 'Pyrotenax' system, in which the heating cables are cast permanently into the floor.

One very interesting development in underfloor heating has recently been put on the market by Heating Investments Limited, 10. The object of this is to diminish the time lag in thermal response which must always apply to any floor in which the element is laid on a screed. The method chosen is to cement aluminium foil to ½-in. expanded plastic insulating sheeting and to cement this in turn to the subfloor. The heating element is then laid in the foil and located between 2-in. hardboard strips. By this means the foil serves both as an insulant and as a means of evening out the heat. Three feet square aluminium alloy sheets are then laid over the hardboard and these in turn are covered with linoleum.

warm air systems

A method which can be used effectively as a part of whole house heating systems is that of heating and distributing air. The advantages of this method are that large quantities of air can be heated quickly, that the outlet temperature and velocity can be varied rapidly, and that the equipment is simple and cheap to install. On the other hand the surface temperatures and the mean radiant temperatures of an enclosure will be lower than the air temperature, circumstances which may cause discomfort. Warm air systems are essentially simple pieces of equipment involving a boiler (which may be of virtually any type), a heat exchanger and a fan. The boiler may also serve to heat the hot water, in which case you have to be careful to see that the space heating demand does not prevent your getting a hot bath when you want it. The heater cabinet may discharge air direct into the rooms, or it may discharge through ducts. Since this field of heating is characterized by a single piece of equipment which is of standard pattern and sells at a standard price, it is both possible and useful to quote actual prices for them.

Radiation Ductair was the first warm air whole-house heating system to appear on the market, 11. This was designed for the 4-5-bedroom house and units fired by solid fuel, gas, or oil are available. These have space heating ratings of 35,000-50,000 Btu/hr and the installed cost of the systems with water heating is £380-£550, the solid fuel and gas installations being the cheaper.

Recently the Ductair 20 giving a space heating output of 20,000 Btu/hr, suitable for the 3-4-bedroom house and fired by all three fuels, has been introduced at an installed cost (including water heating) of £190-£240.

Just introduced is the oil-fired space heater, the Ductair 0885, rated at 85,000 Btu/hr, and this is suitable for heating the large house, schools, churches, offices, shops, factories, etc.

A characteristic of all Ductair installations is that the warm air is discharged at low level and returned at high level, giving quick and very uniform heating.

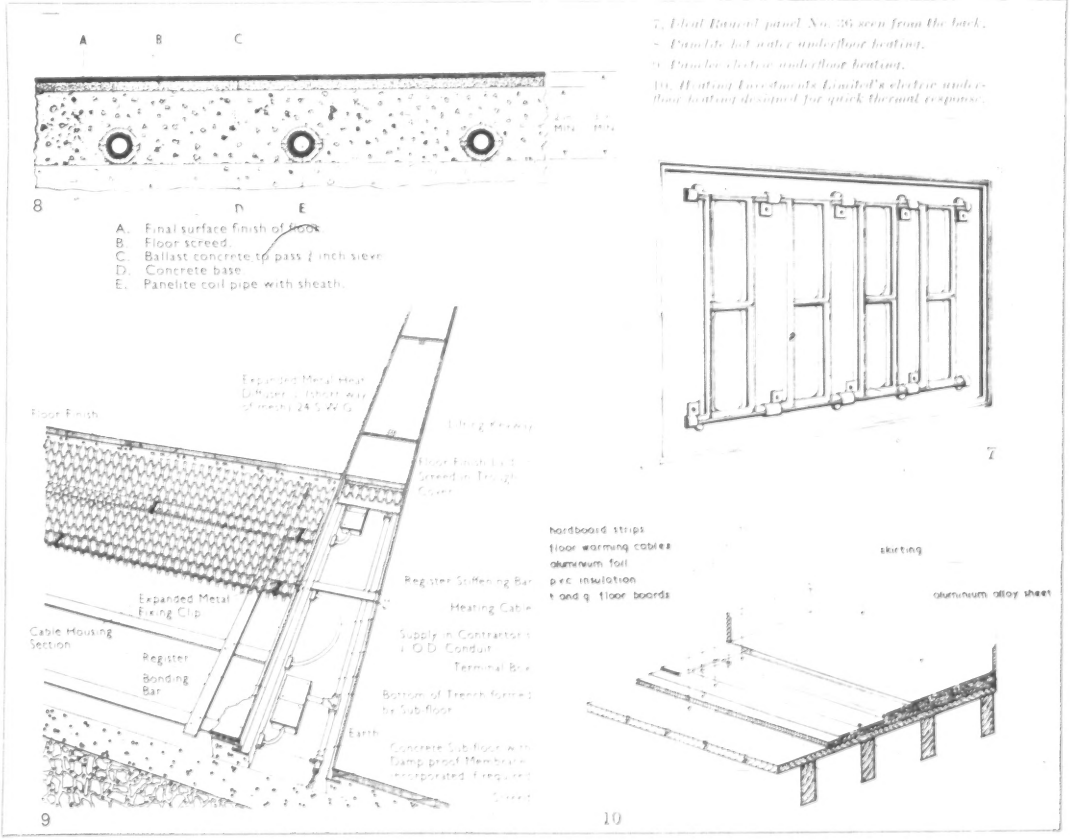
Another ducted heater with its own heat source is the Hideyon F45 by William Sugg and Company Limited, 12. This is a gas-fired unit designed for building-in and, though it is only 17 in. by 12 in. square by 34 in. high, has a rating of 17,000 Btus. Well supplied with control equipment, it is called by the makers a 'selective heating unit' with reference to the ease with which the heat output can be directed to particular rooms. Prices vary according to the amount of ducting required, but an average figure is £100. Though it does not attempt to provide full heating to volumes greater than 3,500 cu. ft., mention must be made here of Radiation's 'Heatmaster.' This provides cooling, space heating and water heating from a single (solid fuel) source and the cost installed (including the hot water cylinder and all controls) is about £270.

Another long established firm to be concerned in whole house heating is Aga Heat who, after entering the space heating field with units of small rating for one or two rooms, now market a model, the 'Agavector Senior,' which, with a rating of 25,000 Btus, may be said to belong to the whole house heating class, 13. This differs from 'Ductair' units in that it comprises a heat exchanger only. It has no ducts and is designed for fixing into a storey height cubicle 2 ft. square on plan, giving directly on to the rooms it is to heat. Heated by an Agamatic 30/80 (or boiler of similar rating) it is envisaged as part of a hot water heating system and it is suggested that the indirect cylinder can be fixed in the same cabinet above the heat exchanger. The price is £82 10s.

continued from page 146]

system can respond quickly to changes in the demand for heat. An exception to this is when the construction is used for thermal storage. Whether the floor is designed for thermal storage or not, the construction should include insulating materials which ensure that the heat is released in the right direction and not wasted; and care should be taken to select materials which have low thermal movement and neither crack or discolour when subjected to temperature variations.

Underfloor heating systems do not differ greatly from one another and I therefore illustrate three only by way of example. The first is a hot tube system which is marketed under the trade name 'Panelite' by Allam and Sons Limited, 8. Since the surface temperature of underfloor heating panels cannot be higher than 85 or 86 F, there is often difficulty in providing enough heat by this means alone and, therefore, other supplementary means must be found. In some cases it might be convenient to provide this by other water heated sources, such as radiators or skirting heaters. This may create difficulties, however, as the water in these other sources would normally have to flow at a higher temperature than that in the underfloor pipes. To

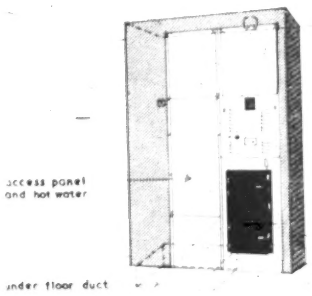


7, Ideal Boiler-panel No. 36 seen from the back.

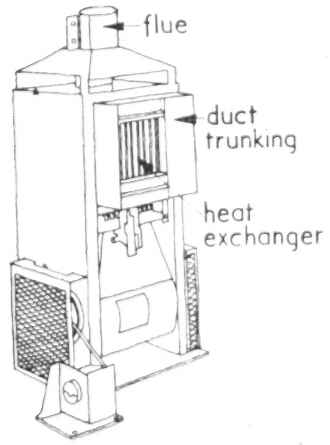
8, Panelite hot water underfloor heating.

9, Panelec electric underfloor heating.

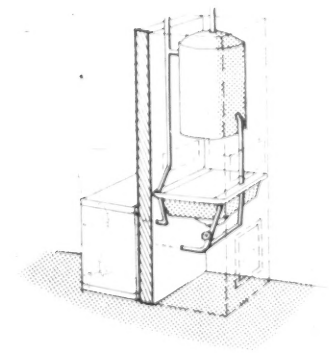
10, Heating Investments Limited's electric underfloor heating designed for quick thermal response.



11, *Radiation Ductaire whole-house heating unit.*



12, *Halcyon E45 gas-fired ducted warm air heater.*



13, *cut-away diagram of Advertiser Senior heat exchanger with indirect cylinder installed in same enclosure.*

Similar both in scope and in its method of operating is the Janitor warm air heater cabinet. This can be bought either as a freestanding unit encased in a metal cabinet (i.e. for installing in existing buildings) or without a cabinet for building-in. It is made in two ratings: Model 3 at 25,000 Btus which sells at £71 and Model 5 at 36,000 Btus which sells at £77, both prices ex works.

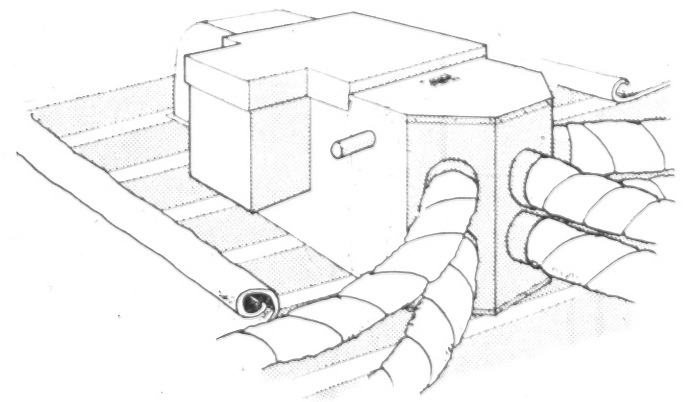
The Potterton warm air unit was developed primarily for bungalows; and comprises a heat exchanger and fan, a series of flexible ducts and an inlet duct and filter for recirculation, all of which are designed to rest on the ceiling rafters, 14. The unit operates off the hot water circuit and is made in two sizes: the 'Minor' with a rating of 17,000 Btus./hr. and the 'Standard' with a rating of 25,000 Btus/hr. The price for the Standard unit is £97, but to this must be added the price of the ducts and other accessories which in a house of average size would be of the order of £24.

Potterton warm air units are conceived as equipment which can be added to an existing system: 'Harton Units' marketed by Structural Services Limited are more comprehensive in their scope and can comprise not only the heat source, the fan and the heat exchanger, but the hot and cold water cylinders. This tendency to all-inclusiveness derives from the interest of this firm in the idea of packaged plumbing. There are two 'Harton Units': a solid fuel version rated at 33,000 Btus/hr. which sells for £236 and a gas-fired version rated at 60,000 Btus/hr. which sells for £257. Both of these prices include the cold water storage tank, the hot water cylinder and the associated plumbing and all equipment in both cases is housed in a steel frame occupying a floor space 2 ft. 7 in. by 2 ft. 3 in.

conclusion

With so embarrassing a choice before him, what is the architect to do? Is he to pursue the goal of intermittency to the extent that you 'switch' on the heat when you enter a house or a room and 'switch' it off again when you leave, expecting a response as instant as with the electric light? Against this there is the consideration that if a house is permitted to fall below a certain temperature there is always a danger of damp through condensation. To avoid this (as Sir Alfred Egerton pointed out) temperatures in a house ought never to drop below 50 F.

Another point which seems worth making in conclusion is the amount of heat which the architect can himself contribute, free, gratis and for nothing, by letting the sun into a building at the right time of day. One of the discoveries of the schools programme was that large uncurtained east windows let in an important amount of heat. Glass is diathermanous, letting in long wave radiations from the sun but stopping short wave radiations from within a room. For this reason (and despite its bad conductance characteristics) it can cause a considerable build-up of heat in an otherwise unheated room. If double glazing were to become general (and already there is a strong case for it), this factor will deserve more serious consideration.



14, *Potterton warm air unit.*

MANUFACTURERS

Agi Heat Limited, 20 *North Audley Street, London*, W.1. (*Mayfair* 8454.)

Beeston Boiler Co. Ltd., Beeston, Nottingham. (*Beeston* 54271.)

Benham and Sons Limited, 66 *Wigmore Street, London*, W.1. (*Hunter* 4422.)

Copperad Limited, 1 *Yeat Street, London*, W.1. (*Welbeck* 1226.)

Crane Ltd., 15 16 *Red Lion Court, Fleet Street, E.C.4.* (*Fleet Street* 6511.)

Econa Modern Products Limited, Aqua Works, Highlands Road, Shirley, Birmingham, 11. (*Cheaks Green* 2211.)

Gulf Radiators Ltd., 229 *Regent Street*, W.1. (Regent 1051-6.)

Heating Investments Limited, 45 *Church Crescent, London*, N.3. (*Finchley* 2743.)

Janitor Boilers Limited, Vale Road, Camberley, Surrey. (*Camberley* 2471.)

Paneltec (Great Britain) Limited, 21 *Bloomsbury Street, London*, W.C.1. (*Langham* 4234.)

Thomas Potterton Ltd., Cavendish Works, Birchfield Road, Wandsworth, S.W.18. (*Vandyke* 7202.)

Pipetenace Limited, Hedgeley Road, Hebburn-on-Tyne, Co. Durham. (*Hebburn* 83 2244.)

Radiation Group Sales Limited, Warm Air Division, 10 *Mortimer Street, London*, W.1. (*Langham* 7541.)

Steel Radiators Ltd., Stelrad Works, Bridge Road, Southall, Middlesex. (*Southall* 2663.)

Structural Services Limited, Gas Division, 2 *Harton Street, London, S.E.8.* (*Tideway* 5412.)

William Sugg and Company Limited, 67 73 *Regency Street, London, S.W.1.* (*Victoria* 3211.)

THE INDUSTRY

Foamed Polystyrene

One of the newer plastics (to the architect anyway) is foamed polystyrene. Its outstanding characteristics are: a very light weight (2 lbs. per foot cube) and low thermal transmittance (*U* 0.22). British Resin Products now market this material under the name Distrene X and they have issued a brochure in typescript that is entirely free of 'advertising.'

It is a technical description of manufacturing methods, thermal properties, mechanical properties, methods of bonding to wood, metal and glass and, very briefly, an indication of uses, as insulation for refrigerators, pipes, etc.

In fabrication, the 'raw' material is put into moulds after heating. It contains a 'blowing agent' which, on further heating, comes into spectacular action by expanding the material to 65 times its original volume, thus filling out the mould.

The finished product has an impervious skin and an interior structure of closed cells so that it is unaffected by contact with water. Sheets of this strange material can be cut with a saw or a hot wire with a low voltage current. Or it can be moulded and bent in a press at about boiling water temperature.

British Resin Products Ltd., Devonshire House, Piccadilly, W.1.

Roof Insulation

It was not until BRS began its heating research, in pursuit of the government's fuel saving policy after the war, that industrialists realized what they had been wasting. The insulation of factory roofs in particular showed such spectacular savings—often the cost of post facto insulation could be saved in less than 4 years—with a continuing saving in smaller boiler plant and lower running costs.

But insulation of an existing building is not always easy, it may entail fiddling work and disturbance to processes going on in the building. Now a new advertising leaflet describes a method of adding another skin *outside* the existing roof. Timber battens are laid on the existing sheeting over the purlin lines. Between these a glass fibre blanket is fixed and over this a new layer of asbestos sheeting. This is first screwed down into the battens and then standard roofing bolts are fixed right through both old and new sheeting.

The company has worked out methods of dealing with verges, ridges, eaves and roodlights.

Universal Asbestos Cement Manufacturing Co. Ltd., Tolpits, Watford, Herts.

Gas Heaters

The conversion of coal into heat by gas is more efficient than by electricity and thus less costly. But electricity is cleaner and more flexible to employ. The fatuous competition with itself waged by the nationalized fuel and power industry is a fairly even contest except that gas has the disadvantage of special care over fire danger and ventilation to clear carbon monoxide especially difficult with overhead heaters. Nevertheless, gas units up to 70,000 BTU per hour input find extensive use and a recent booklet brings the various types together in fairly systematic presentation. Opening pages discuss advantages, limitations, precautions, methods of designing installations, heating characteristics, etc., in a way fairly sensible for the architect with tables

[continued on page 150

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of output related to area and mounting height.

Part II of the booklet consists of information sheets of seven types of heater, with photographs, dimensions, and sectional drawings of each. The booklet, to BSS size 8¼ in. by 5¼ in., is produced by *Bratt Colbran Ltd.*, 10 *Mortimer Street*, W.1.

Silkscreen Tiles

The silk screening of ceramic tiles is not a new process and most repeating pattern tiles are produced in this way. What strikes the eye in thumbing through H. R. Johnson's catalogue is the departure from the accepted or normal conventions of tile decoration, most of which are based on 'pre-silk' screening techniques; e.g., the geometric repeating pattern that we know so well from a hundred chipped childhood fireplaces. These tiles enjoy the freedom of the techniques and could as well be wallpaper or any other printed surface. The ever present problem of repetition of pattern is skilfully got over by the use of a small-scale pattern which in itself is not symmetrical so that when multiplied over a large area and used in different positions (i.e. pattern vertical or on its side) the total effect is one of life and variety and rigidity. The patterns themselves are pleasant enough and it would have been nice to know the designer's name. The brochure is very well handled. It is in colour and shows a detail of the tile together with the effect of many tiles and variations in colour. Clear and concise.

H. and R. Johnson Ltd., Stoke-on-Trent.

Sealing for External Walls

Sealing compounds for external walling materials that are impervious to water have had a troubled history. There have been cases where whole facades have required stripping out and resealing because manufacturers' claims proved unreliable and BRS, who might otherwise help, are hamstrung by not being able to recognize any product by its trade name and by the difficulties involved in accelerated weathering tests.

With these cautions I write of a new compound marketed by Farnaloes, the paint people. It is based on Butyl—a synthetic rubber and is made in strips, sheets and 'U' section gaskets.

It is called BRR 1304 and three claims are made for it. First, that it is extremely durable and chemically inert, second, that it does not go solid and third, that it is ferociously adhesive to pretty well any dry surface.

In manufacture the material is treated with a coating to keep its adhesiveness out of action and thus simplify storage and handling. On the site, or in the workshop it is brushed with a solvent such as white spirit which releases its adhesiveness and then applied. Adhesion reaches its most determined degree after 2 or 3 days.

Two kinds are made: 'uncured' (or soft) and 'composite' which is a hard core of cured BRR 1304 covered by a layer of the softer material. Strips are made from ⅛ in. to 1 in. thick and from ¼ in. to 4 in. wide—available in both forms.

One hopes that the claims made are justified. The inclusion of a BRS test in the advertising brochure would nourish hope more than anything.

T. and R. Farnaloe Ltd., Rochester Row, S.W.1.

Double Glazing

The same company Farnaloe's are also selling a Belgian sealed double glazed unit. The edge consists of a metal channel, labelled as 'lead' in the catalogue, fixed to the glass with a patent metal-to-glass bonding material. Units are evacuated and filled with dehydrated air before sealing, during manufacture.

They can be made in double, triple or even quadruple units, the latter being more appropriate to refrigerated cabinets than buildings. Almost any type of glass can be used and spacings between ¼ in. and ½ in. are listed, all units being made to order. The company offers a guarantee for five years against condensation or the penetration of dust into the interspace provided the units are installed in accordance with their instructions. They claim a sound reduction of 40 to 50 decibels with double glazing—about twice that of single sheet glass.

The catalogue reads as though it were a straight translation from the French (? or Flemish) and so does not quite answer all the questions one has, particularly questions of price. Many architects have found that the similar units marketed in this country are so costly that fuel economies does not always justify them.

One might note in passing that BRS does not seem to attach so much importance to the sealing of double glazing that we once thought to be so important.

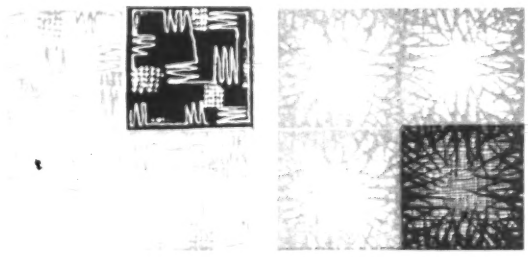
T. and R. Farnaloe Ltd., Rochester Row, S.W.1.

A Dutch Coke Boiler

A Dutch coke boiler with the homely name of Redfyre Emma is now available in this country, being made under licence by Newton Chambers. It is made in three main types ranging from 240,000 to 6 million Btu per hour rating. Efficiencies of 85 to 90 per cent are claimed for this hopper type boiler in which the flue gases are blown from the firebed into a secondary combustion chamber fed with pre-heated air and thence to a final heat exchanger. The brochure is unusual in quoting approximate prices. For example the 240,000 Btu is £730, the 1 million Btu is £1,160.

Newton Chambers and Co. Ltd., Thorncliffe, Sheffield.

[continued on page 152



L, two examples of diagonal half-drop screening of ceramic tiles, one of each being depicted in black to clarify the design.

another attractive carpet design by CARPET TRADES CONTRACT SERVICE

One more proof of successful co-operation, with client, architect and carpet manufacturers meeting for personal discussion and consultation. Carpet Trades Ltd. offer this specialised service to all their contract clients. The carpet installation shown here, produced exclusively for Royal Mail Lines, is in the 1st class dining room of *R.M.S. Andes*. The carpet, designed to the specification of the architect, is in 'Sentinel', another high quality fine woollen Wilton, with a striking modern design on a tan background. (Goods are supplied through normal trade channels only).

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LEAD WORKS LANE, CHESTER.

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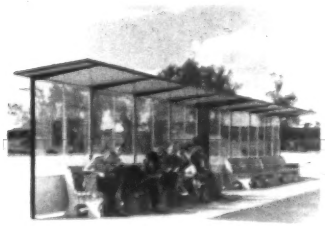
2, structural aluminium portal frames

Structural Aluminium

The two significant characteristics of structural aluminium (low weight apart) are its low elastic modulus and its high cost (relative to steel). In design they betray themselves in wide attenuation of sparely used material the built-up rather than the monolithic member. But the portal frames of a recent works canteen, illustration 2, seem to deny these effects. The box sections have ¼-in. flanges and 12-gauge sides of Noral B 51 SWP alloy, pop riveted together with internal diaphragm stiffeners at 2-ft. centres. A compressed straw slab roof deck is supported on 5 in. by 2½ in. bulb channel purlins. For some reason the clerestory is constructed in reinforced concrete. This slightly puzzling building was designed by Louis de Soissons, Peacock, Hodges and Robertson; engineer: R. T. James, Structural contractors: Aluminium Alloy Fabrications Ltd.



3, shelter with 20-gauge alloy roof.

Another venture in the same material is for roadside shelter roofs, 3. The verticals, cantilevers and panels are in steel with a 20 gauge alloy roof, which saves weight and eliminates painting.
Designer: D. R. Mellor. The shelter has been approved by the COID but surely not the seats!
Northern Aluminium Co. Ltd., Banbury, Oxon.

Steel and Asbestos Sheeting

Future architectural historians if they ever come to view architecture functionally should allot a significant place to the corrugated iron (and later asbestos) sheet of the between the wars period.

Since then, sheeting has climbed socially and now we have a curious marriage in 'colour Galbestos' a steel sheet galvanized both sides as an adhesive for asbestos felt. This is bitumen impregnated and then a final veneer of culture is applied colouring of red, grey, buff or green.

This form of composite sheet is made in EVB, Box Rib W or Box Rib R sections and can be part of the Q panel or deck system of insulated cladding.

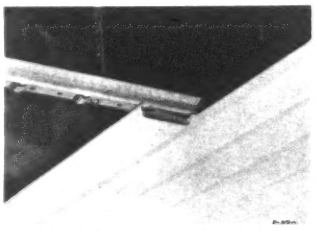
A new catalogue shows, besides the colours, fixing details at ridge, gable, verge, patent glazing and gutter, etc. But it says nothing about price.
Robertson Thain Ltd., Ellesmere Port, Wirral, Cheshire.

Acoustic Ceiling

A Danish type of acoustic ceiling is to be marketed in this country by Hurseal Ltd. in association with Avery's, the blind makers.

It consists of long narrow strips of trough section finely perforated aluminium alloy the flange edges of which both point the same way. This allows the strips to be hooked over lugs which project from the bottom of channel section supports. One advantage claimed for this method is that the supporting channels need not be fixed at exactly regular spacing, a feature which comes into its own with existing buildings, and makes for speed of erection.

Strips are made in any length or in short lengths to form a kind of 'parquet' floor pattern they are filled on the topside with mineral wool absorbent and finished in stoved enamel to specified colours and the Danish company has worked out various kinds of edge treatment. The new company to be formed by



4, perforated aluminium trough sections for acoustic ceiling

Hurseal and Avery is to supply and erect at first Danish, but later British made material.
Hurseal Ltd., 229 Regent Street, W.1.

Factory Heating

The main problems in heating factories are first that there is a great deal of air and probably a high air change rate, secondly that heater units must not obstruct machines or other service lines which is not always easy to manage, especially where planning changes may occur as

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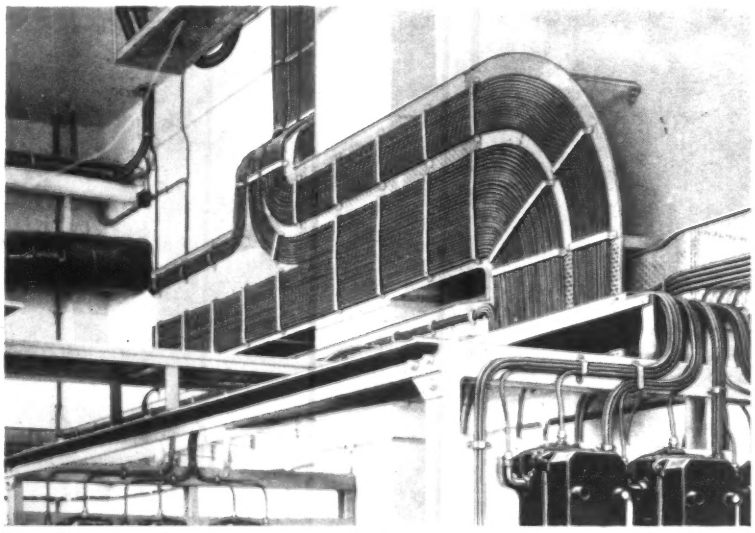

Photograph by courtesy of Monsanto Chemicals Limited

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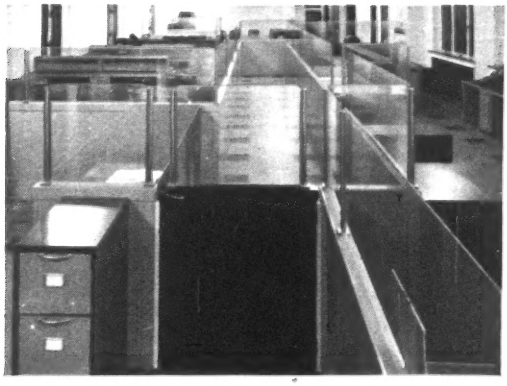
Westminster Bank Limited, Overseas Branch, Threadneedle Street, E.C.2. Architects: S. E. Everson and D. E. Searles, A.A.R.I.B.A.



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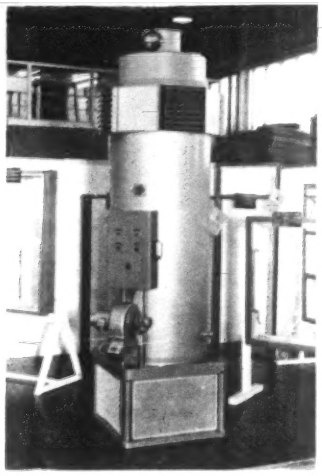


5, unit heater for factory heating.

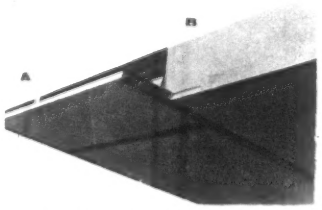
production processes alter. One solution that is being used to an increasing extent is the large unit heater. Some of these are truly gigantic in output over 1 million Btu per hour in the form of hot air.

John Thompson Beacon window fame have produced one with an output of nearly 600,000 Btu. It is direct oil fired model, the heat exchanger of flue gases to air being in the form of a spiral "bundle" of tubes. An efficiency of conversion of 87 per cent is claimed using 10 seconds oil and a 2 h.p. motor which pushes the air out at the rate of 320,000 c.c. per hour with a temperature of 122 F. There are automatic controls for safety and to delay starting of the fan until the exchanger has warmed up. Height 11 ft. 3 in., weight 12 cwt.

John Thompson Beacon Air Heaters Ltd., Wolverhampton.

'Do it yourself' Insulation Method

It is rather strange to find the 'do it yourself' movement entering, so to speak, the building industry. This is the claim made for a method of insulating factory roofs presumably because the factory workers can 'do it themselves' in slack periods or weekends. The method consists of a framework of H sections in metal, along the top flanges of which are a number of sliding clips. Into these are hooked metal strip hangers which are bent by hand over the purlins. In the illustration, A shows a cut-away section through the run of sheeting, and B one of a selection of trimming angles to finish off an area. The H section is made in various depths to fit tightly over various types of insulating material. Those mostly used are ½-in. fibre board and 2-in. foil backed plasterboard.



6, method of inserting sheeting and trimming angle.

The Phoenix Timber Company Ltd., Frog Island, Raunham, Essex.

CONTRACTORS etc

Musgrave Park Hospital. *Architects:* Richard Llewelyn Davies in association with Samuel Stevenson & Sons. *Main contractor:* Wm. Logan & Sons. *Sub-contractors: Heating installation:* Grenger Ceilings Ltd. *Light fittings:* Frederick Thomas & Co. *Sanitary fittings:* Stilsons Sanitary Fittings Ltd. *Sanitary fittings:* Dent & Hellyer Ltd. *Ironmongery:* Alfred G. Roberts Ltd. *Lino flooring, tanking and roofing:* The Neuchatel Asphalte Co. *Tubeleaves:* Manlove, Alliott & Co. *Bedpan washers:* Sumerling & Co. *Hot air ovens:* Laboratory Thermal Equipment Ltd. *Sterilizing sinks:* James Stott & Co. *Facing bricks:* The Northern Brick Co. *Metal windows:* Crittall-McKinnex Metal Window Co. *Cubicle curtain track:* Rotanoid Ltd. *Window curtain tracks:* Silent Gliss Ltd. *Paints:* Hadfields (Merton) Ltd. *Plastic domelights:* William J. Cox Ltd. *Beds, overbed tables:* S. B. Whitfield & Co. *Lifts:* Evans Lifts Ltd. *Tubeleaves:* Sterex Ltd. *Blinds:* James Anderson Ltd. *Tables, chairs:* Finmar Ltd. *Chairs:* Tecta Ltd. *Bedside lockers:* Remploy Ltd. *Signalling system:* Gent & Co. *Light fittings:* The Merchant Adventurers of London Ltd. *Terrazzo:* Apuana Marble Industries Ltd. *Anglepoise lamps:* Herbert Terry & Sons. *Plumbing installation:* Wm. Coates & Son. *Electrical installation:* A & C Electric Ltd. *Clay tiling:* W. D. Hendersons Ltd. *Air conditioning:* Miles-Ashanco Engineering Co. *Paints:* Montgomerie Stobo & Co.

House near Hythe. *Architect:* James Williams. *General contractors:* P. Charlier and Sons. *Sub-contractors: Bricks:* Ashford and Saccodt Co. *Sanitary fittings:* Adamsez Ltd. *Heating:* Aga Heat Ltd. *Radiators:* Steel Radiators Ltd. *Hardware:* Alfred G. Roberts Ltd.

Factory at Wakefield. *Architects:* R. J. Mock and R. E. Enthoven. *General contractors:* Fell Construction Co. *Sub-contractors: Electrical installation:* F. H. Wheeler Ltd. *Heating:* Sulzer Bros. Ltd. *Roofing:* Roberts in Thain Ltd. *Steelwork:* S.G.B. Ltd.

Offices for British Olivetti Ltd., Berkeley Square, London, W.1. *Designers:* Misha Black and John Diamond. *General contractors:* F. G. Minter Ltd. *Metal partitioning:* The Ayrshire Dockyard Co. *Lighting fittings:* Atlas Lighting Ltd. *Acoustic ceilings:* Horace W. Cullum Ltd. *Travertine ceiling tiles:* Armstrong Cork Ltd. *Cupboard units:* Rippers Ltd. *Meeting room table:* Andrew A. Pegram Ltd. *Door furniture:* Alfred G. Roberts Ltd. *Plastering:* Jonathan James Ltd. *Decorations:* F. G. Minter (Decorations) Ltd. *Ventilation:* Ellis (Kensington) Ltd. *Paint:* Hadfields (Merton) Ltd. *Carpets:* Taylor and Marr Ltd. *Plants:* Flower House Ltd. *Mosaic:* Art Pavements and Decorations Ltd.

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